

HANDBOOK
FOR
HEALTH VISITORS



MATERNITY AND CHILD WELFARE BUREAU
INDIAN RED CROSS SOCIETY

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HANDBOOK

FOR

HEALTH VISITORS IN INDIA

BY

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WITH A FOREWORD BY

MAJOR-GENERAL J. D. GRAHAM

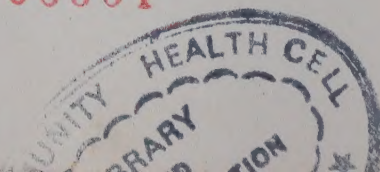
C.B., C.I.E., K.H.S., I.M.S.

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FOREWORD

THE author of this book, both in her capacity as an officer of the Women's Medical Service and in her subsequent post under the Indian Red Cross Society, has been intimately associated with the more recent developments in India of maternity and child welfare work, and the associated activity—the training of health visitors. She has been closely associated with me in the work of various committees dealing with these activities, more especially since she assumed the Directorship of the Red Cross Bureau of Maternity and Child Welfare. In her capacity as secretary of the Lady Reading Health School, Delhi—the Central Training School for Health Visitors in India—she has been closely connected with the development of this aspect of health education in India.

It is, therefore, with peculiar pleasure that I have acceded to her request to write a short introduction; and, in doing so, I have been permitted to include in the succeeding remarks some of the authoritative views of one of my British colleagues on the Health Committee of the League of Nations—Dame Janet Campbell—who had the opportunity of seeing some of the manuscript.

Health visiting is recognised as an indispensable part of social health services in all countries where such services have been established. The visiting nurse, the *infirmière visiteuse*, the *Fürsorge-Schwester*, is found wherever there is any organisation of preventive work for the welfare of women and children or of sufferers from tuberculosis and similar diseases with which the community is concerned.

The health visitor may be, and often is, expected to act as a 'polyvalent' officer, and to assist with all branches of local public health in which the services of a trained nurse and social worker are required. There are obvious advantages when the same person is able to advise the mother as to her own health when she is expecting a baby, to teach her the principles of mothercraft, to explain to her the importance of suitable feeding and hygiene for the little child, to warn her of the risks of infectious disease and to tell her the ways in which these risks may be avoided or lessened, to encourage her to follow the advice given by the school doctor or by the tuberculosis officer; in

short, to act as the family friend and counsellor in all everyday problems of health and sickness which the mother of a family must constantly face.

But her fundamental, and in many cases her only, duty is work in connection with maternity and child welfare, and a knowledge of infant hygiene is thus an essential part of her educational equipment. Her business is primarily educational; it is to teach the mother how best to care for her own child and protect it from unnecessary illness and suffering. She must therefore possess sound and adequate knowledge of the physiological care of the normal infant, as well as of the common ailments likely to affect it. She must be able to advise the mother in such matters as breast-feeding and weaning and in all that pertains to the healthy up-bringing of the normal baby. She should also understand the physical and mental problems likely to arise in the care of the 'toddler,' which are apt to escape due attention because of our special preoccupations with the infant and the school-child.

The health visitor should also have some knowledge of the principles underlying preventive medicine and nursing: she should be able to appreciate the organisation on which her work is based, and the way in which it is linked up with the wider and more general aspect of public health.

Because I am so deeply impressed with the importance of the services which can be rendered by a wise and capable health visitor, I have particular pleasure in contributing, with the help above mentioned, this short introductory note to the book which Dr. Ruth Young has written for the use of those wishing to enter this profession. I am sure it will be useful both to students and practitioners of preventive nursing in India and the tropics generally, as they will find in it, expressed in clear and simple language, an account of what should be studied in regard to the welfare of infants and young children.

Dr. Ruth Young is an enthusiast with unrivalled experience in this class of health work in India, and what she has to say will, I feel sure, be eagerly studied by all who are specially interested in this subject.

Simla, India.

June 23rd, 1933.

J. D. GRAHAM, MAJOR-GENERAL, I.M.S.,
Public Health Commissioner

with the Government of India.

PREFACE

THE book now issued is the outcome of fifteen years' practical experience in the training of health visitors. In 1920 the author published *Maternity and Child Welfare*, and a second edition was called for later. Since that time considerable alterations and improvements have taken place in the course of training and the work of maternity and child welfare has advanced greatly, so that it has been necessary to re-write the book almost entirely. In *Maternity and Child Welfare*, antenatal work was included as part of the book. This subject has now been dealt with in a separate volume, *Antenatal Work in India*, published in 1930. This is a companion volume to the present one, and is written primarily from the health visitor's point of view.

As before, the chief problem to be faced in writing a book of this kind is to reconcile a high standard of work with practical difficulties. These concern not merely the actual working of child welfare schemes, but the previous education of the health visitors themselves. A quotation from the preface to the former book may be repeated here: 'There are those who will criticise the following pages because the standard held up is not sufficiently high, while there are others who will doubtless exclaim that it is impossible to put into practice, in India, all that is recommended. It is not intended to disarm criticism at the outset by this apologia, but only to ask critics to keep the two points of view in mind. The author is only too conscious that she has not always successfully steered between the Scylla of an unduly low standard and the Charybdis of impracticability.'

Another difficulty which has stood in the way of making the book all it should be is that continued leisure to write it has been lacking. It is not at all easy to write a book when the demands of the routine work of an office, touring and teaching already make up a pretty full day's work. Writing a book means, too, keeping up with the times as regards the literature produced on the subject. That literature is now fairly extensive and time to read books and journals is scanty. It is hoped, however, that health visitors will find the book useful, not merely as a means of

passing examinations but as a guide in their daily work. Though primarily meant for them, it may perhaps have a use also for medical women, nurses, and the educated Indian public.

The books which have been used for reference are too numerous to be mentioned here, but grateful thanks are due to the authors who are thus forced to be anonymous.

Two acknowledgments are, however, necessary. One is to Major-General Graham, C.B., C.I.E., K.H.S., I.M.S., who has kindly written the Foreword. This is only one of many acts for which we owe a debt of gratitude to General Graham. As Chairman of the Committee of the Lady Reading Health School he has been actively instrumental in promoting health education for women in India, and has not spared himself either time or trouble in this capacity. The other is to Dr. J. M. Orkney, W.M.S., who gave much valuable advice and criticism on the text, and is also responsible for help in seeing the book through the press.

Simla.

June, 1933.

RUTH YOUNG.

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CHAPTER I

THE CARE OF THE NEWLY-BORN INFANT

THE baby needs special attention during the first week or two after birth. Reflect on the number of adjustments he has to make! Instead of existing in a fluid which protects him from every jar and change of temperature, the infant comes into an environment where he has to lie on a hard bed, be touched by various hands, and the temperature of which may be several degrees above, or many degrees below, that of his own body. Then he has to learn to breathe. Oxygen is no longer supplied to him through his mother's blood, he has to take in his own supply. He must learn, too, to depend on his own efforts for nourishment. The mother, it is true, has a fluid ready for him, but he must learn to withdraw it from her breast, and learn, too, to digest, absorb and assimilate it.

The general aim in caring for the newly-born infant is to secure conditions which resemble those which he has been existing in as far as this is possible, while gradually accustoming him to the new ones. The chief needs are an even temperature, a comfortable bed, as little handling as possible, a regular food supply and avoidance of infection. A little reflection will show how easy it is to depart from all these conditions in an Indian household. The health visitor's duty is to try and secure them for the baby by careful teaching of the mother. This teaching must be begun before the baby arrives—hence the importance of antenatal work.¹

Before going into these details there are several facts we must observe about the newly-born infant and his first few days and weeks of existence.

It is a well-known fact that the first week and first month of infant life is that period in which the greatest mortality occurs. The following figures are taken from the Annual Report of the Public Health Commissioner with the Government of India (1929):

¹ See *Antenatal Work in India*, especially pp. 8 and 9.

One-third of the total infant deaths under one year occurred in the first week of life.

Out of one hundred infants dying in the first month of life, sixty-five died in the first week.

Out of every thousand births, fifty-three infants died in the first week of life.

About half the total infant deaths under one year occurred in the first month of life, the other half occurring in the remaining eleven months of the year.

These facts clearly show that if the infant mortality is to be reduced it is necessary to pay special attention to this early period in the child's life.

Why is it that the infant succumbs so easily at this stage?

There are various reasons. *Firstly*, the child may be *born* with low vitality and poor physique. This may be due to inherited diseases (syphilis) or to poor nourishment or illness of the mother during pregnancy. Such conditions can only be remedied by careful antenatal work. *Secondly*, the child may have a difficult passage into the world, which injures him and deprives him of a fair start in life. Prolonged labour, an instrumental delivery, a malpresentation which involves interference, pressure on or bleeding from the cord, insufflation of water or mucus at the birth—all these may have serious consequences to the child. In addition there is the risk of infection through the cord by cutting the cord with a dirty instrument at the birth. Recent investigations have shown that many children die soon after birth from tears in the membranes surrounding the brain, which cause fatal hæmorrhage even when the delivery has not been instrumental. Careless midwifery, even in normal cases, may lead to asphyxia in the newly-born, or tetanus. Through her antenatal work and her teaching of *dais*, the health visitor should be able to anticipate complications of labour, secure a safe delivery, and see that the *dai* conducts the labour in a clean way. In this way the factors which cause death at or soon after delivery may be reduced considerably. *Thirdly*, the child may be exposed to a wrong environment after birth, and so placed under conditions which have a debilitating effect on him. The right conditions are those mentioned above.

The *bed* is important. If comfortable the baby will lie in it contentedly, provided he is properly trained from the beginning and not constantly taken into the arms of the mother or another

person. More is said about training elsewhere (see p. 123), but in this matter, as in all others, it is the *beginning* which is important. The arms of the mother are warm and soft and give a sense of security and support, so are naturally preferred to the cot by the infant, who quickly distinguishes between the two. But the cot can be made comfortable, and it has the great advantage of preventing handling and changes of temperature. Pillows to support the infant, as used by Muslim mothers, help to give the infant a sense of support. The cot can be of any material which the means of the parents allow. The sides should be six to eight inches high, to protect the child from draughts. The cot should have a firm mattress. The plan recommended by Sir F. Truby King, of putting a blanket under the mattress and then folding it up over the baby, is excellent in cold weather. In cold weather also the temperature of the bed should be kept up with hot bottles, or bags of heated sand or salt. These must be carefully covered and not allowed to come into direct contact with the baby. The baby should be kept in the cot all the time at first, only being taken out to be fed or bathed. It is not necessary to take the baby out of bed to change the napkins. This can be done in the bed, and in this way handling and changes of temperature are avoided. If there are mosquitoes or flies a net must be put over the cot.

In warm weather little or no covering is required. But the mother must remember the changes of temperature. If the temperature is 100° F. or over in the day, no covering is required, but when the temperature falls in the evening the baby must be covered.

The reason for this care about the covering of the baby is that in infants the 'heat regulating mechanism' is not well developed. It is this mechanism which ordinarily keeps the the body temperature the same whatever the temperature of the surrounding air. In an infant the mechanism is not well developed at birth, because he has up to the time of birth been surrounded by an even temperature in the *liquor amnii*. It is often noted that babies born in very hot dry weather tend to have temperatures above the normal—sometimes alarmingly high. Such temperatures are not due to illness or infection, but to the fact that the body cannot adjust itself to the abnormally high temperature of the air. Similarly cold has a very depress-

ing effect on babies, and the temperature may fall several degrees below normal. They cannot protect themselves either by exercise or by putting on extra coverings, and the body temperature is not kept up by the mechanism above alluded to. In addition we must remember that the surface area of the body in an infant is relatively larger per unit of body weight than in an adult, and hence the loss of heat by the skin is greater.

The question of *bathing* the baby is closely related to the subject of loss of heat through chilling. At the time of the first bath oil must be used to get rid of the *vernix caseosa*, which is found in varying amount on the skin. Subsequently, in normal babies a bath with hot water and soap should be given in a warm room and the child dried quickly. Bathing a young baby out of doors, or even indoors, in cold weather, by the usual method of pouring water over him, means chilling down the infant severely. Premature or feeble and thin infants should not be bathed with water at all, but should be rubbed with warm oil for some days or weeks, till they are able to stand a bath with water. It has been proved that the loss of weight, which almost every baby suffers in the first week of life, is considerably reduced by using the oil bath even for healthy babies.

The heat centres must, of course, be educated. We cannot keep the infant in an even temperature for ever, but the education must be gradual.

Many infants show a varying degree of *jaundice* of the skin soon after birth. The cause of this jaundice is not properly understood, but in any case it is nothing to be alarmed about and requires no treatment.

Avoidance of *infection* is very important for the baby. The child has little resistance at this age, and even a cold throws him back seriously. No one with a cold or cough should be allowed to come near the infant.

Details about feeding will be found elsewhere (see p. 22). It must be remembered that the younger the infant the greater number of calories it requires per pound of body weight. If the mother's milk is slow in coming in, the baby may be given some sugar and water, or weak condensed milk, or a weak feed of a dried milk. Condensed milk is valuable because it contains much sugar and little protein, and is therefore easily digested by the baby and supplies a relatively large amount of calories.

CARE OF THE CORD

The cord requires careful attention on account of the risk of sepsis. With a trained midwife in charge it should be dressed daily till it falls off, in the manner learned by midwives. A muslin bandage, which is changed daily, is the best covering. Care should be taken that it is not applied too tightly. A knitted cotton bandage is satisfactory, and these can be stocked at welfare centres and sold or lent to mothers, or they may be taught how to knit them from soft yarn. Some think that if the cord is not likely to receive proper attention it should be left undressed. There is something to be said for this, as it is certainly harmful for the dressing to get dirty and remain unchanged. After the cord drops off the umbilicus should be dressed with boric powder and kept covered till entirely healed. After that binders or bandages are not necessary. An imperfectly healed umbilicus is seen frequently at welfare centres. Sometimes it is necessary to touch the part with silver nitrate solution (1 per cent), but usually, if kept clean and dry, it heals spontaneously. Umbilical hernia is met with frequently, probably as a result of pulling on the cord or imperfect healing. The hernia becomes apparent later on, when the child is a few months old. It should be treated by strapping (see p. 100).

CARE OF THE EYES

The eyes are usually bathed with boric lotion at the time of birth, and in addition weak silver nitrate solution or argyrol or protargol drops are often used. This is a prevention against infection, particularly gonorrhœal infection, which is very common. The eyes are usually bathed daily with boric lotion for about ten days if a trained midwife is in attendance. This must be very gently and carefully done. The infant's eyes should be shaded from too much light at first.

CARE OF THE MOUTH AND NOSE

It is customary to wipe out the mouth at the time of birth. This, too, must be done with great care. Many nurses are taught to continue this practice subsequently. There is, however, no need for it, and it is much better omitted unless it can be done by a very skilled hand. 'Thrush' is often caused by careless wiping out of the mouth. After the birth the nose

should be cleared of mucus. After that it requires no attention unless the child has a cold, when the nose may be gently stroked, from above downwards, to get rid of the secretion. The habit of cleaning out the nose with screws of cotton wool is a bad one, and more likely to push matter up the nose than dislodge it.

CARE OF THE GENITALS

During the first bath the foreskin should be examined, and it should be gently retracted for the first few days or weeks.

At or soon after birth the child should be examined to see that there are no abnormalities present. If any are found medical advice should be taken.

The health visitor or nurse should make certain that the baby has passed urine and meconium soon after birth. Meconium is passed until the third or fourth day. The practice of giving castor oil to infants soon after birth, to clear the bowel of meconium, is a thoroughly bad one.

CHAPTER II

GENERAL DEVELOPMENT OF THE NORMAL INFANT

THE average baby at birth weighs between six and seven pounds, and is about 20 inches in length, has a pink colour, a soft skin with a good deal of downy hair, especially on the head and back, and a varying amount of subcutaneous fat. The baby has a lusty cry, can move the arms and legs and head in an aimless fashion, but does not execute purposeful movements. At the end of a year the child has made marvellous progress—in this first year of life he changes more than in any subsequent year. We have to trace the course of his development in this chapter.

WEIGHT

The weight of newly-born babies in India varies according to race. A sufficient number of data have not been collected to enable us to determine what the average weights are. Babies born of Pathan or Punjabi Musulman parents are naturally heavier than those of Madrassi or Bengali parents. Small babies are not necessarily delicate, and large ones are often thought to be more difficult to bring up. Boys are slightly heavier than girls. The important point about weight is not its initial amount but its continuous and symmetrical increase. Almost every infant shows a decrease in weight in the first few days of life. At the end of a week he may have regained his birth weight, but frequently does not. The initial loss of weight can be reduced as described in Chapter I. The child should double his weight by the end of five or six months, gaining 4 to 6 oz. per week. At one year the birth weight has usually trebled, the growth being slower during the second six months of life. For details as to weighing and its importance, see p. 137.

HEIGHT

The height during the first year increases from about 20 to 28 inches. Growth in height and the relation between height and weight is more noticeable in toddlers, and has more significance then (see p. 104).

THE HEAD

The growth of the head corresponds to that of the weight, that is, it is most rapid in the first year. The average circumference (English textbooks) is $13\frac{1}{2}$ inches at birth, and the increase is about 4 inches in the first year. Heads of boys are rather larger than those of girls. In infants the head is large in proportion to the body, in comparison with adults. In an infant the head is one-quarter of the total height, while in an adult it is one-eighth.

The fontanelles, or points where the bones of the head meet, are open at birth. The posterior one closes early—at the end of the second month. The anterior fontanelle closes about the eighteenth month. Late closure of the fontanelles usually indicates rickets. The sutures of the head bones are united by membrane only at birth. Bony union takes place by the sixth month.

THE TEETH

There are twenty milk or temporary teeth. Their order of appearance is usually as follows :

2 Lower central incisors	...	...	6 to 9 months
2 Upper central and 2 upper lateral incisors			8 to 12 months
2 Lower lateral incisors and 4 anterior molars			12 to 14 months
4 Canines	...	...	16 to 22 months
4 Posterior molars	...	...	24 to 30 months

Although these are the average times of appearance, there are wide variations from them which are found in normal children. In India, in the author's experience, the average times of appearance of the first teeth are later than those given above, but all teeth have usually been cut by $2\frac{1}{2}$ years. Irregularity in the order of appearance of the teeth and great delay in eruption are signs of rickets.

MUSCULAR DEVELOPMENT

As already stated, the first movements of the infant are automatic or reflex, and aimless. He can suck, and he can grasp an object, such as a stick or finger, laid in the palm. But these are 'reflex' actions, dictated by instinct and not voluntary on the baby's part. Crying is another reflex action. The development of voluntary movement is gradual. By about the fourth month the infant tries to grasp an object

placed within his reach. At that time he begins to raise his head, and can hold it up if the back is supported. At six to eight months he can sit up, shows pleasure in recognising familiar people or objects, and reaches for a toy or a bright coloured object. At the ninth to eleventh month he can stand, at twelve to fifteen months he begins to walk. Very often children discover that they can progress by crawling, and some become very rapid in this movement. Those who never crawl often walk sooner. All normal children want to exercise themselves, and pull themselves up and try to walk of their own accord. Strong muscles make strong bones. Early walking never causes bandy or bowed legs. The leg bones have a natural curve at first, which the muscles straighten out.

Delay in performing these various movements may be due to both physical and mental causes. Among the physical causes are general weakness due to malnutrition, rickets and paralysis; the mental cause is mental deficiency. Skilled advice is required in both cases.

DEVELOPMENT OF THE SENSES

Sight. Vision is poorly developed at birth. After a week or two the infant begins to follow a moving light or bright object. He cannot focus his eyes on an object, however, for about two months, hence the squinting which often alarms parents. Definite recognition of objects comes a month or two later. Colours are not distinguished till after one year.

Hearing. The infant is deaf for the first day or two, but after that hearing is acute. Different voices are recognised at the end of the third month.

Taste. This sense is highly developed at the time of birth.

Smell. This also is developed at birth, though not so highly as in the case of taste.

Touch. It also is developed at birth, but only highly so on the lips and tongue. Elsewhere the sensation is vague at first and develops gradually.

Speech. The only method by which the infant can express himself is a cry. He uses it chiefly to express his annoyance, anger, fright or displeasure. At the end of two months the baby makes cooing noises when petted or spoken to. These gradually take on a more definite meaning. Words are gradually associated with special desires or feelings of pleasure, or are understood to

convey such to parents or others. An average child can use a few words at one year old, and understands more. Intelligent parents often think that their children suffer from 'tongue tie.' At birth the frænum, or under attachment of the tongue, is short. In almost all cases it stretches without any difficulty, and does not interfere with speech.

Pulse. The rate in a newly-born infant is the same as that in intra-uterine life, namely, 120 to 140 per minute. The rate becomes gradually slower, until at one year it is about 100 per minute.

Respiration is more rapid in infants than in adults, being about 44 in the newly born. The rate becomes slower during the first year of life. The abdomen moves more than the chest and the breathing is often irregular, though the child is quite normal and healthy.

Action of the Bladder and Bowels. Urine is passed very frequently at first and there is no bladder control. The intervals are gradually lengthened, and the child learns to make known the fact that he wishes to pass water. The movements of the bowels are from two to four daily at first. They are soft and semi-liquid, of an even consistency and light yellow colour. After a month or two the daily number is reduced to one or two and the stools become gradually more formed, especially after solids and cow's milk are added to the diet. Control of the bowels is learned gradually, and training has a great deal to do with the passage of the motion at stated intervals.

CHAPTER III

GENERAL CARE OF THE INFANT

IN this chapter we shall consider the normal care and attention required in the upbringing of a healthy infant.

The health visitor seldom gives this care herself, but she has the very important task of teaching it to the mother. Much of what is called 'mothercraft' consists simply in knowing what are the needs of the infant and how to meet them. Knowledge of mothercraft will do more than anything else to prevent infant mortality and secure a healthy generation of children.

In teaching mothercraft the health visitor requires to be very *adaptable*. She must learn to make her lessons applicable to the poor as well as to the moderately well-off home. She must know how to deal with the indifferent, lazy, careless or stupid mother, as well as with the intelligent and energetic one.

FRESH AIR

In India the real difficulty about fresh air is that of *cold* air. There is usually no temptation to exclude air if it is warm air. Cold air is feared. An out-of-door life is common where the temperature of the air is such as to be pleasant, or anything above pleasant. Over the greater portion of India the day temperature is pleasant, even in winter. The cold nights of North India are what cause people to shut up their houses and pull the blankets over the head. Mothers must be taught the essential difference for babies between *breathing* cold air and exposing the surface of the body to cold air. The former is health-giving and invigorating, the latter is depressing and enfeebling.

They must also understand the need for movement in the air. Gently moving air removes moisture from the skin, gives a sense of freshness, stimulation and vitality. In a shut up room the air becomes stagnant and moist. It is impossible here to go into details about the precise way in which metabolism is increased by cool, moving air. This subject can be studied in other books, but the simple fact is that such increase has been amply proved. The growth of infants has been shown to be

greater in the cooler months of the year. Animals living an out-of-door life are fitter than those shut up. Infant mortality is greater in town life than in rural life, owing to the density of housing which shuts out air, and this in spite of the fact that medical advice is more freely available in towns. The death rate from diseases like phthisis is higher in towns. Infants who live an open-air life do not catch colds or other respiratory diseases readily, they sleep more soundly, have good appetites, and thrive well.

There are several ways in which babies are deprived of fresh air when they might easily get it. One is that they are frequently carried about out of doors under a *chaddar*, *sari* or *burqa*. Another is that they sleep with their mothers in the same bed. A third is that they are covered with sheets or blankets, to keep off the flies or mosquitoes. Careful teaching will lead to the abandoning of some of these habits. With the moderately well-off the provision of a separate bed and a mosquito net are possible. With the poor it is more difficult. And in poor homes there is the further difficulty that lack of sufficient bedding leads to closing up all sources of ventilation to protect against winter cold.

There is a great prejudice against cool, fresh air in illness. Many mothers are condemned to overheated, unventilated rooms during the puerperium. The infant shares the atmosphere, to the detriment of its health. A sick baby is similarly deprived of air. Some newly-born infants are not clothed for seven days. To protect them from cold, they are altogether covered with a blanket or *rezai* for the time.

Health visitors must understand the need of gradual exposure of the infant and toddler to cold. As explained already (see p. 3), the heat-regulating mechanism of the infant must be educated. A newly-born infant must be kept very warm. Gradually he should be accustomed to cold air. A toddler, therefore, requires less clothing than an infant. His heat-regulating apparatus has been educated, and besides he takes exercise and keeps himself warm by movement.

SUNSHINE

The question of sunshine is very closely related to that of fresh air. The importance of the sun's action has been realised of late years, and its value in the prevention of disease and

promotion of health has been discovered experimentally. Everyone knows that plants need sunshine. Sow some seedlings in a box and keep it in the dark, and see what is the result! The plants will come up with pale leaves and will grow towards the direction of the light. The plants are smaller than those grown in the sun. Animals such as dogs, bred in captivity, deprived of sun, develop rickets; monkeys die of tuberculosis. Children in cities are apt to be pale and anæmic, they catch colds easily and are less sturdy than those brought up in villages. Of late years, the sun has been used as a definite means of cure for diseases such as tuberculosis. In the Swiss mountains, where the air is free from dust and there is a maximum of sun, children suffering from surgical tuberculosis (i.e. of bones or glands) are exposed to the sun gradually. After a time their skins are tanned, the muscle tone improves, the lesions heal, and the child is restored to health. Such children become accustomed to lie and go about with scarcely any clothing on, though there may be snow on the ground. In countries like England, where there is little sun, owing to fog and coal dust in the atmosphere, 'artificial' sunlight is used. Children are exposed to the rays from special lamps, which have an effect similar to that of sunlight. Excellent results are reported from such treatment, which is carried out at many child welfare clinics. It is used for cases of rickets and debility chiefly.

In India we have abundance of sunshine—fortunately. Sunshine is the enemy of disease. There is a proverb which says, 'The doctor lives on the dark side of the street'—those who live on the sunny side do not need him! Thanks to the action of the sun, many places are sweet and clean which would otherwise be foul and foster disease. Children brought up in the country need never suffer from lack of the sun. It is otherwise with the town dwellers, however, and it is in towns where most of the welfare work in India is being done at present. In towns the streets are often narrow, the houses are high, so that the sun cannot get to the rooms. Children may also be deprived of sun in the same ways as they are deprived of air. Those whose mothers observe purdah may be confined in small courtyards, or even in single rooms.

The giving of sun-baths to babies can be taught at welfare centres. Even in winter the direct sun is warm; the babies can

be exposed carefully, and rubbed with oil by the mothers. Oiling is usually popular and so is massage. Both are good for the infant, the massage improves the tone of the muscles and prevents the small children who cannot move much themselves from getting cold. In hot weather mothers should be advised to use sun-baths early in the day, as the heat of the midday sun is harmful to the children.

CLEANLINESS

Bathing for infants should be a daily routine. The skin in infants is thin, delicate and easily irritated, so that scrupulous cleanliness is necessary. In addition, babies have no control over the bowels, and careful washing is needed for this reason as well as because they often soil themselves by regurgitating milk. The bath besides is refreshing, and the infant usually enjoys it thoroughly.

For small babies bathing in a basin or small tub is best, since the infant is less liable to chill by this method. The temperature of the bath should be about 98° F., that is, a heat pleasant to the elbow. If the weather is cold the bath should be given indoors and in a warm corner of the room. The baby's face and head are washed first with water and then dried. The rest of the body can then be washed in the mother's lap with soap, and the baby put in the tub. He should be allowed to kick and splash for a minute or two when able to do so. He should then be taken out of the tub, and dried with a soft, absorbent towel. The drying should be done gently, with as little rubbing as possible. After drying the clothes are put on.

A few further points should be noticed in connection with the bath. Pure soap should be used, a fancy, scented and coloured soap is neither necessary or desirable.

The hair should not be washed with soap oftener than once a week. If soap is applied daily it leads to depriving the hair of too much of the natural oil of the scalp. The soap becomes matted on the head. If this happens it can be removed by applying a little oil at night and washing off the next morning, or combing with a fine-tooth comb. Oiling of the head, as of the body, is popular. Oil should be sparingly used on the head, however. It is better to brush the scalp, and so encourage the pouring out of the natural oil on to the hair.

Many nurses are taught to clean the baby's *nose* with screws of cotton wool. This is not really advisable, for the material in

the nose is more likely to be pushed up than dislodged by such a method. The natural way of 'blowing the nose' in an infant is to sneeze, and so dislodge the foreign body forcibly. The nose may be stroked with the fingers, or else the nostrils may be tickled with a piece of cotton-wool, to make the baby sneeze. A little slightly-warmed vaseline or liquid paraffin, or solution of sodium bicarbonate may be used to help to loosen and soften the material in the nose. It is important to teach a mother how to do this if the baby has a cold, since the blocking of the nose by a cold in the head makes sucking difficult.

The *mouth* of a healthy infant needs no cleaning or wiping, though nurses are frequently taught this also. Wiping out the mouth often causes thrush, owing to injury of the delicate mucous membrane.

In boy babies the *foreskin* should be drawn gently back at first, and the part washed. There may be difficulty at first, but gentle daily attempts usually meet with success. After a month or two, provided the foreskin is quite free, this should no longer be done. In Muslim families circumcision should be advised early. It is much less painful, and attended with less shock, if done in the first weeks of life. The operation should be performed by a doctor, if possible.

The *eyes* are usually bathed with boric lotion for the first few days after birth. If this is done it must be carried out very carefully and gently. It is probably best for this to be done by someone trained in nursing, and not by the mother or relatives. If there is the least sign of inflammation a doctor must be consulted, but a health visitor may safely use a weak protargol or argyrol solution.

As the baby grows the temperature of the bath may be lowered. This is good in order to educate the heat-regulating mechanism. A tepid douche after a hot bath is stimulating, but the reaction of the baby must always be watched. If he shivers or becomes blue then he is not ready for colder water. Brisk rubbing after a tepid douche helps the child to react, and can be carried out when the child is several months old and the skin less tender. At this age, too, the Indian method of bathing may be adopted, that is, the child is not placed in a tub, but the water is poured over him after washing.

For bathing of premature and delicate babies, see p. 4.

CLOTHING

The clothing of infants naturally depends on the climate in which they are born and the season of the year. The big change of temperature which may occur between day and night in some parts of India requires corresponding changes in clothing, and this is a point on which mothers require educating.

In a cold climate a young baby must be kept very warm (see p. 4). If there is undue exposure to cold at this stage the vaso-motor centres get into the habit of constricting the surface blood vessels, and such babies in later life may suffer chronically from cold hands and feet. On the other hand, over-clothing does the opposite, the surface blood vessels remain permanently dilated. What we have to aim at is gradual and consistent education, so that the heat-controlling mechanism is educated and the vaso-motor centres learn good habits, like any other set of nerves.

WINTER CLOTHING

Wool is the best material, and knitted garments are light and warm and permit freedom of movement. They also keep a lot of air in their meshes, which makes for warmth. Flannel or woven woollen materials are second best. The baby should have a vest of knitted wool or flannel, and another garment of a *kurta* shape, with sleeves. The *kurta* should be long enough to cover the feet when the baby is small. It can be shortened later. The cuff end of the sleeves can be run through with tape or ribbon to keep them down, and the arms warmer. Knitted socks or booties should be provided. When the baby is taken out of bed a small blanket or a shawl is required.

Cotton materials are not so warm as woollen, but home-spun (*khaddar*) garments are warmer than machine-made cloth. Their disadvantage is that in most instances they are thick and clumsy, and not adaptable to the infant's small frame. Wool is comparatively inexpensive if mothers can knit. (See also p. 156.) Flannelette is not a good material. Babies with sensitive skins may need a muslin vest or *kurta* under a knitted or flannel one. These can be made out of old saris.

In warm climates, or in warm summers of North India, very little clothing is required—a muslin or thin cotton *kurta* is sufficient. Small babies suffer easily from prickly heat, which makes

their lives a misery, and the minimum of clothing helps to prevent it.

Instruction as to washing garments, especially woollen ones, should be given to mothers, but are not detailed here since the subject is dealt with elsewhere.

One of the most essential of a baby's garments is the napkin, which, alas, is too frequently conspicuous by its absence. Mothers require much education and encouragement on this subject. The advantages to the trained are so obvious, and the disadvantages of *not* using napkins are so obviously insanitary, not to say disgusting, that it is not easy to be patient on this subject. What is too often seen is the soiling of bed clothes, mother's clothes, or shawl, by the baby, with inefficient attempts to clean up the mess. This state of things is of daily occurrence in families whose means permit of hygienic habits.

Mothers can be instructed as follows about napkins:

1. *Size.* The usual size is 25 inches square, but rather smaller ones will do. Beware, however, of too small a size, it is quite ineffective.

2. *Material.* Any soft, absorbent, easily washable material will do, Turkish towelling, cotton twill, *khaddar*, double folds of muslin.

3. *Method of Applying.* The usual method is to fold the square into a triangle, place the folded edge under the baby's back, fold the upper points over the abdomen and pull the lower point up between the legs. The napkin may be secured with a large pin. Another method is to sew a piece of tape on the lower point and pull the other points through it. This obviates the use of a pin. Others again fold the napkin across, place it lengthways under the baby, pull the free end between the legs and pin at both sides. This makes the napkin rather bulky between the legs.

4. *Washing.* The napkin must be removed as soon as it is wet or soiled. Two *chattis* or *gharas* may be kept full of water. The wet napkins should be kept in one and the soiled in the other. The wet napkins can be wrung out in water, changing the water a few times, and dried. They should be given to the dhobi to boil frequently. Soiled napkins should be washed with soap and water and boiled. Plain soap must be used and no soda.

5. The mother should wash her hands after touching the soiled napkin.

Napkins are required until the baby has acquired control or can indicate his needs, longer of course at night than in the day. Rubber or mackintosh drawers, which are seen in use by the well-to-do, are not advisable. They retain the moisture and may chafe the skin.

THE BED AND BEDDING

The common practice is for the infant to sleep with the mother, and some of the reasons why such a practice is harmful have already been explained (see p. 12). Apart from the all-important question of training, the temptation to give night feeds is much greater if the baby shares the mother's bed. He does not get the same supply of fresh air, and may be suffocated by the mother's breast or chilled through the clothes being thrown off. Cots or cradles are not costly, they can be made of wood and *newar* or basket-work. The hanging net cradles, available in the bazaar, are also useful, since they are off the ground and do not occupy space, and are cool in hot weather. They must not be swung, however. No form of rocking or swinging cot should be used. Even where the parents sleep on the floor, the baby should have a cot for protection from accidents and freedom from draughts. The bottom of the cot should be firm; string which sags or loose *newar* is bad. The cot should have a small mattress, and it should be protected by a small piece of mackintosh, over which a piece of old blanket can be tucked. A sheet should cover all, and it must be frequently changed and washed. For covering, woollen blankets or shawls are best. Cotton quilts (or *rezais*) are heavy and airless and not so warm. For those who can afford it down quilts are best of all, since they are warm and light at the same time.

A mosquito net must always be used when there are mosquitoes, sand flies or flies. The mesh must be fine. When a mosquito net is necessary in warm weather the cot should be placed where there is a breeze, otherwise the baby gets very hot and does not get enough air.

In very cold weather, or if the baby is delicate or ill, hot bottles may be needed. They must be carefully covered, to prevent direct contact with the baby's skin.

SLEEP, REST AND EXERCISE

At first the infant spends the greater part of the twenty-four hours in sleep. It is essential to induce good sleeping habits from the start of life. If the infant is put in the cot after feeding, and not rocked or lulled in the arms, the habit will be formed. There may be a little crying, but if the mother refuses to take up the baby he soon learns that it is better to sleep at once. At the same time, when the infant is a few months old, he *will* want a little attention and 'mothering' and this must be given. His awakening mind must meet with some response from other human beings, and this must not be neglected. Recognising this, the mother must plan that the baby's time of being awake must suit her convenience, she must not become a slave to the baby. Probably the best time is from about 4 p.m. to 6 p.m., that is, before the second last feed, as that will ensure a good evening and night sleep. For part of that time the baby should be placed on a bed to kick and exercise himself. This can be done at other times, too, as the baby grows older. Later a 'kicking' or playing pen is useful. An inverted *charpoy*, on which some bamboo cross-pieces have been nailed, will serve the purpose. A blanket can be spread on it and the baby can lie on it. He gradually learns to roll over, crawl, raise himself up, stand and walk. The cross-bars provide exercise for the arms and develop the chest thereby. Most infants can regulate their own exercise, they do not do more than they are able to. But, of course, they must not be allowed to sit up and walk too long when learning these accomplishments.

A word may be added here about the position in which the child should be carried. It has already been noted that the child holds up his head at about four months and can sit up at six to eight months. These actions are performed when the nerve centres controlling the movements are developed and the muscles are able to support the head and back. Before that time the infant should be kept lying down, as otherwise the proper curve of the spine will be interfered with, owing to the lack of support of the muscles. We constantly see mothers holding and carrying babies in the upright position before they are ready to adopt it. This is another argument for leaving the baby in his cot as much as possible, but it is one which mothers find it hard to appreciate. It is also a reason why babies should have

freedom to exercise their developing muscles in the way nature has dictated, without premature attempts to sit and walk.

Perambulators are becoming a common sight in the towns of India. This is all to the good, since it is much better for the child to be taken out lying down in a perambulator than in the arms of the mother or a servant. Perambulators can also be conveniently used for the day sleep, if there is a garden or a verandah. The hood of the perambulator should not be raised to protect the child from sun, as this prevents access of air and the space inside the hood becomes very warm. A wire frame can be attached, over which a curtain can be hung in the direction necessary. Such an arrangement protects the baby from the sun while allowing free access of air. The perambulator should, of course, be long enough to allow the baby to lie full length. While perambulators have many conveniences, it must not be thought that the possession of a perambulator means that a young baby should of necessity be taken out in one daily. This is not needful if there is a garden or suitable verandah. But for taking a baby to a public garden from a narrow street, for visits to a clinic, and so forth, a perambulator is a great convenience. It goes without saying that the perambulator should never be wheeled about to put the baby to sleep.

At the end of the first year a baby should have twelve hours' sleep at night and about three hours' a day. The times for sleeping should be kept with perfect regularity. Sound, regular, unbroken sleep is a prime need of the growing child. No convenience of the parents should upset the sleeping of the child. It is thoughtless and cruel to take a child to evening entertainments or feasts. Though at first care should be taken that loud noises do not waken or frighten the baby, after he is a few months old he should be accustomed to sleep in the presence of a certain amount of noise.

Such adjuncts to sleep as 'comforters' or dummy teats and pellets of opium are, of course, to be strongly condemned. The dummy appeals to the child's sucking instinct, and lulls it to sleep, in the same way as most infants would willingly stay at the breast indefinitely even though not actually taking milk. The one practice is just as unnecessary as the other, and both are habits that need never be formed. The dummy is almost always unhygienic. It is, even when hung round the child's

neck, anything but sterile, and it is often dipped in milk, honey, sugar or *gur*, to make it more acceptable to the child. It was formerly thought that the use of the dummy caused adenoids and deformed the palate. This idea has been largely abandoned, but the dummy habit none the less is a pernicious one.

The giving of opium to infants is a common practice in some parts of India. Opium is sometimes given for convenience, i.e. in the case of a working mother who has to be absent from her child, and sometimes out of a genuine belief that it is necessary to 'keep out the cold.' This habit is equally injurious. It often causes severe constipation in infants, it makes all habits irregular, and causes the child to be stupid and disinclined to exercise either mind or body.

ACTION OF THE BOWELS

Care must be taken to ensure proper action of the bowels. Training is all-important. The infant must be encouraged to have the bowel movement at a regular time once or twice daily. Suggestion operates to secure this. The child is 'held out' daily, or twice a day, at the same time, and he soon learns what is expected of him. Mothers are usually sensible about this, but they too often 'hold out' the child over an open space or a drain, which is very objectionable. It is no more trouble to hold out the baby over a small chamber, or glazed earthenware vessel, which can be at once covered and removed. A child of a very few months can be trained to be 'clean' as regards bowel motions, if the training is begun early. This is a great saving in washing and trouble to the mother. After every motion the buttocks should be carefully washed and dried. Old clean rags can be kept for the purpose.

CHAPTER IV

BREAST-FEEDING

SINCE lactation is a natural function and a duty which is undertaken by the great majority of Indian women, it may seem strange that so much space should be devoted to it. It is necessary, however, to understand how to get the best out of any natural function, and especially so in the case of a function which is of such importance at the start of life as that of breast-feeding. Experience goes to prove that many mothers are not as successful in nursing as they should be, through quite avoidable mistakes. Nowadays also, among the middle classes, there is a distinct tendency to give up breast-feeding, either wholly or partially, at the least sign of difficulty. Since modern conveniences, such as bottles, teats and dried milks are now available, Indian mothers are tempted to abandon the suckling of their children. The results of such a proceeding are usually very disastrous to the babies, and, even if the child does not suffer obviously, he is not getting what is his birthright, and what is best and safest for him. Many health visitors will be surprised at the amount of teaching they have to do on this subject, and how many foolish ideas they have to combat. Some mothers think that because they have lost one or more children in infancy it must be the milk which is at fault, and they will say, 'My milk does not suit my babies,' or 'My milk poisons my babies.' Others think that if the baby cries it *must* mean that he is getting too little. If he vomits, it is sign that the milk does not agree with him. As we shall see, these results are almost invariably due to quite other causes. No food can be as good for the child as breast-milk, it is clean and sterile, it is given to the child under natural conditions and at the correct temperature; it is of a composition which is easily digested, and it contains substances (immune bodies) which help to protect the child against infection. The act of sucking is good for the baby, it develops his jaws and teeth, prevents the growth of adenoids and encourages nose breathing. Breast-milk requires no preparation and costs nothing in money. The

mother is saved time in preparation of feeds, and spends nothing on milk or bottles. It is a stimulus to her own health. There is a close relation between the uterus and the mammary glands. The stimulation of the breasts by the act of sucking aids in the contraction of the uterine muscle. The extra blood supply which went to the uterus during pregnancy now goes to the breasts, and involution of the uterus is hastened. Mothers who nurse their children do not suffer in health. On the contrary, if the suckling of the child is carried out in the right manner, the mother's health improves, and she has the satisfaction, which has a great psychological effect, of seeing her child grow and flourish. The rate of infant mortality among breast fed infants is much lower than among those artificially fed, and they are less subject to intestinal upsets and to diseases such as rickets; their teeth are better. Health visitors must be acquainted with these facts and do all in their power to prevent unnecessary weaning, either whole or partial.

The real contra-indications to breast-feeding are very few, and no baby should be weaned without a doctor's opinion that weaning is necessary in the interests of either mother or child. If the mother is suffering from a serious constitutional disease, such as tuberculosis, heart-disease, nephritis, it may be inadvisable for her to nurse the child. If syphilis has been contracted late in pregnancy, this is a contra-indication. Breast abscess is not an indication for weaning unless the nipple is involved, and even then only temporarily and in the affected breast. The onset of menstruation is also not a sign that the child should be weaned. If the mother becomes pregnant the child will have to be weaned, but many mothers nurse their infants for several months without being aware that another pregnancy has occurred. Many women have the idea that suckling prevents another pregnancy. This is, of course, quite untrue, and the surprising thing is that so many continue to believe that it is so, despite personal experience to the contrary.

THE BREAST: ANATOMY AND PHYSIOLOGY

One of the first signs of puberty, or the onset of womanhood, is the change which occurs in the breasts. They enlarge and stand out from the breast wall. The nipple becomes more distinct. When pregnancy occurs the breasts enlarge further.

This happens very early, and is another proof of the relation between the generative organs and the breasts. The pigment in the skin covering the nipple and the surrounding area (i.e. the areola) increases in amount. The pain which primiparæ frequently feel in the breasts during pregnancy is due to the enlargement of the breasts. The skin at the base of the nipple is rich in sebaceous glands. These enlarge during pregnancy and are visible as raised spots, commonly known as Montgomery's Follicles. The sebaceous glands secrete an oily substance, which helps to keep the skin soft and supple and prepares the nipple for the act of sucking. The skin of the breast may show *striae* like those on the abdomen.

The breast consists of 12 to 20 lobes of gland tissue, which are separated and supported by fibrous tissue and contain a varying amount of fat. The size of the breast depends a good deal on the amount of fat it contains, and therefore the size is no guide to capacity for secreting milk. A small breast may secrete just as much milk as a large one, in fact, a large fat breast does not indicate a good breast from the point of view of milk. The lobes of gland tissue are divided into lobules, and the lobules are composed of a great number of minute divisions, called *acini*. The breast may be compared to a number of bunches of grapes in which each bunch represents a lobule, while the individual grapes may be likened to the acini. These acini are lined with epithelium, which secrete the actual milk. The fluid discharges into the tiny duct leading from the acinus; these ducts join up with others to form larger ducts, and these again join up, forming about 15 or 20 ducts, which open into a number of small sacs or ampullæ, where the milk collects. These ampullæ are situated behind the nipple. If a section of the breast were made at the edge of the areola it would cut through the ampullæ. From the ampulla the milk passes to the nipple in a series of small ducts. If the breast of a nursing mother is squeezed, just behind the areola, milk is seen to be squirted out in tiny jets, sometimes to some distance. To test whether there is milk in the breast, pressure should be applied *behind* the region of the areola, that is, to empty the ampulla. Pulling or squeezing the nipples will not expel milk. If a child is observed at the breast it will be seen that it grasps in its mouth not merely the nipple, but a portion of the surrounding tissue. By this means the child's

jaws actually compress the ampullæ and drive the milk forward through the ducts into the mouth. The emptying of the ampullæ causes a further supply to be poured into them. The amount of pressure the child uses to suck can be seen by the attempt to remove a child from the breast when sucking vigorously. The breast is released with difficulty from the child, and on observing it one can see what portion of it has been in the child's mouth.

The actual secretion of milk begins before the birth of the child. In primiparæ watery fluid is excreted from the breast during the latter months of pregnancy. The real flow of milk occurs, however, after the child is born, and the act of sucking has much to do with the continuance of the function. As will be seen later, the psychological state of the mother affects the secretion materially in addition. As has already been noticed, the breast varies in type, and mere inspection will not give us much information as to the amount of milk which the breast will secrete. In multiparæ the breasts are naturally more pendulous than in primiparæ. What is of great importance, however, is the type of the nipple. A properly formed nipple is essential to success in nursing. Fortunately, the number of cases of badly formed nipples is very small in India. But as such nipples cause great difficulty when they do occur, it is worth while noticing them. In some women the nipple is very small, and scarcely projects from the surface of the breast. Such nipples can be made to stand out by careful treatment during pregnancy, and the sucking of the child develops them further. Depressed nipples are more difficult to deal with. The nipple may be not merely depressed, but actually retracted behind the surface of the surrounding tissue. Such nipples require great care during pregnancy to prepare them for the act of sucking (see below). In multiparæ the nipple may be over-developed and with a large 'stalk.' The difficulty here is in the case of a small or weak baby, who finds it hard to get the nipple into its mouth and exercise the proper suction. Here the treatment begins after the birth of the child, and consists in the patient endeavour to help him to suck. The mother must express some of the milk into the baby's mouth to encourage him.

PREPARATION FOR BREAST-FEEDING

This consists of two parts—first the preparation of the breast

and nipple, and second the measures to be taken to ensure a good flow of milk.

Most textbooks deal with a dreaded complication of the first weeks of nursing—that is, the formation of a breast-abscess. In India this is comparatively rare, perhaps because malformation of the nipples is infrequent, but also probably because thin clothing and a warm climate keep the nipple dry. A sodden condition of the nipple fosters cracks, and subsequent abscess formation. Besides this, babies are not applied to the breast much according to Indian customs during the first few days, and prolonged sucking efforts are avoided. This is important because it is at the beginning that the skin is most tender, and it must become gradually accustomed to the contact of the child's mouth and the pulling and rubbing involved in sucking. It is better, however, to prepare the breast beforehand for the action of the mouth, and this must be done during pregnancy. Just as people accustomed to wear shoes cannot at once walk barefooted without hardening the skin of the feet, so the skin of the nipple must become accustomed to the pressure of the child's mouth. This is best done by a certain amount of handling of the nipple, which can be secured by washing with soap and water and scrubbing with a nail brush. Such a process accomplishes two things—it accustoms the nipple to handling and keeps it thoroughly clean. In the latter months of pregnancy milk oozes out of the nipple, and may cake on it. This is removed by washing and brushing. If a nail brush is used it must be kept scrupulously clean and boiled at intervals. The nail brush should be soft at first, and gradually a harder one can be used. This treatment is necessary especially in cases where the nipple has been so tender or abraded in a previous pregnancy that nursing has been given up or performed with difficulty. In the past alcoholic preparations, such as spirits, Eau-de-Cologne, etc., were used to harden the nipple, but these tend to dry the skin by removing the natural oil, and make it more liable to crack. After washing the breast the nipple may be handled further by rubbing gently with lanoline. *Ghi* may be used by the poor. The handling of the nipples should be done in a systematic fashion, especially if they are depressed. The procedure is as follows: The hands should be thoroughly washed with soap and warm water, the nipples are then washed in the

same way and some grease is applied (lanoline or *ghi*). The two thumbs are placed at the base of the nipple, and then the thumbs are pressed back and pulled apart at the same time. This movement tends to evert the skin of the nipple which was previously depressed or inverted. If the nipple is merely flat it can be pulled out between the fingers and thumb, or else between the first and second fingers. After pulling out in this fashion the nipple can be stroked with the finger tips from the centre outwards. In the case of inverted or retracted nipples, it is essential to correct the inversion before carrying out the pulling movement. Expectant mothers should be carefully taught how to perform both the actions, and the health visitor must satisfy herself that the patient performs them satisfactorily.

If the gland tissue seems small in amount, that is, in a poorly developed breast, we must try to promote development. For this, bathing with hot and cold water alternately and massage are recommended. The bathing may be done first. Two basins are required, with a wash rag or piece of lint for each. One is filled with water as hot as can be borne, the other with water as cold as can be got. The breast is sponged with the hot and cold water alternately for two minutes, giving ten minutes to each breast. This should be done daily, or better still twice a day. The explanation of the efficacy of this plan is that it stimulates the circulation in the breast. After bathing the breast should be massaged. Massage should take the form of stroking the breast from the edge towards the nipple. The movement must be made in one direction only and never away from the nipple, and it should be performed from above, from the sides and from below, going systematically round the breast. When the movement is being carried out from above or the sides, the breast should be supported by the other hand. The whole hand should be used for the movement.

A breast which is *too* active is perhaps more frequently seen than an under-developed one. In this case the breast may be uncomfortably heavy, and requires supporting by a suitable bodice. In the last month or two before delivery secretion may be active, and soft clean rags or pieces of lint should be placed over the nipples to absorb the secretion. This difficulty is practically confined to primiparæ.

We turn now to the other factors which influence the

secretion of the milk itself. Since the milk is made from the mother's tissues, and these again depend on her food supply, we naturally think of the diet as of great importance in preparing for breast-feeding. This is indeed so, but the emphasis should be laid on the quality rather than on the quantity of the diet. We have only to think of the amount of milk taken by a newly-born infant to realise that the expectant mother need not increase the amount of her diet greatly. If she is in good health, is leading a hygienic life and is happy, her appetite is usually good. If the appetite is poor, the general hygiene must be improved, e.g. the bowels must be attended to, more exercise and fresh air must be taken, and if necessary tonics prescribed.

We cannot enter here into details of the diet, which the health visitor studies in any case in different courses. But a few words may be said on the different constituents.

Proteins must be taken in sufficient quantity, since the child's tissues are being formed and the mother's metabolism is working at a higher rate. On the other hand, the digestion of protein gives work to the liver and kidneys, which are in any case working under increased pressure in pregnancy. Excessive in-take of protein is therefore to be avoided. Meat or fish should be taken once a day, and eggs and milk supply most of the remaining protein required. A certain amount will be taken in the form of bread. In the case of vegetarians the protein ration will be got mostly in the form of *dals*, or peas in season. The proteins of *dals* are, however, not so valuable as those in meat or fish, nor are they so easily digested.

Fats are important, not only for their food value but because they are the main suppliers of vitamins A and D. On the other hand, excess of fat in the diet easily produces indigestion and symptoms of 'acidosis.' Animal fat must be present in the diet since vegetable fats do not contain the vitamins A and D. Animal fats can be taken in the form of whole milk, cream, butter, ghi, yolk of egg, dripping.

Carbohydrates are present in sufficient amount in practically every common diet in India. If there is any sign that the fat in the diet is causing indigestion, extra sugar is very beneficial.

Salts are very important in pregnancy. The growing child requires salts and takes them from the mother's tissues. She must therefore supply this loss continuously. This is the expla-

nation of the fact that patients suffering from osteomalacia tend to become much worse during pregnancy. Green vegetables and raw salads contain abundant salts. Peas and beans are rich in iron, milk and eggs contain lime in quantity and egg also contains iron. Cereal grains also contain salts. Soups made from bone are rich in salts. The English method of cooking vegetables, e.g. by boiling in water which is subsequently thrown away, deprives them of their salts, as the salts are thrown out in the water. The Indian method of stewing preserves the salts.

The vitamins are naturally of great importance, vitamin A because it helps to protect the body against infection, vitamin B because it protects against diseases such as Beriberi and Pellagra, and also because it is known to regulate the growth of the foetus, vitamin C because it protects against scurvy, vitamin D because it is necessary for the proper assimilation of lime and phosphorus, and therefore protects the child against rickets. A good mixed diet will probably contain all the vitamins necessary. But the health visitor should see to it that the expectant mother's diet contains, if possible, milk, butter or cream, cereals or whole wheat bread (e.g. *chapatis* made from *ata*), green vegetables, raw fruit, eggs, meat or fish. Milk is essential among vegetarians for supplying protein, salts and vitamins, which may otherwise be had in meat.

It will be at once realised that a diet of this kind is frequently not found in Indian homes. The cause is not exclusively poverty, though poverty is the biggest stumbling-block to the attainment of a proper diet. Among the well-to-do, especially wealthy Hindus, we can find a diet that is far from ideal, consisting, as it often does, of polished rice or white flour as a staple, the use of too much fat in the shape of *ghi*, and over-cooked vegetables. Some women do not eat fruit even if it is available, and uncooked vegetables, such as salad, are not appreciated, milk is considered to cause cough. Where money is not lacking the diet can be corrected, but among the poor it is very difficult. The price of milk and fruit is prohibitive. Hindus do not eat meat as a rule, and the diet is apt to consist of rice or *chapatis* with *dals*, and a few vegetables cooked in oil. The question of supplying milk or other extras at welfare centres is discussed elsewhere, but in the face of real poverty the expect-

tant or nursing mother, with her double burden, is certainly the one whose need should be met first.

The amount of *fluid* taken affects the supply of breast milk. This is specially important after the infant's birth. The loss of water to the mother must be made up. This is specially important once nursing has begun, but in pregnancy also extra fluid serves a good purpose in flushing the kidneys and preventing constipation. Water may be freely taken or *weak* freshly-made tea, barley water, lemonade from fresh limes, or other *sherbets* made from fruits. It is best to take most of the fluid between meals rather than with meals. Water on rising is good, but water drunk on going to bed may disturb the pregnant woman's sleep through frequent calls to empty the bladder. Milk, of course, must be regarded as a food as well as a fluid.

When lactation is just being established, that is, on the fourth or seventh day after confinement, the amount of fluid may be restricted to prevent undue engorgement of the breasts. The same applies when weaning is being carried out.

Patent medicines to increase the amount of milk secreted are not of proved value, and money sometimes spent on them can be put to much better uses.

THE COMPOSITION AND CHEMISTRY OF BREAST-MILK

The composition of breast-milk is as follows (average):

Water	...	...	...	...	88.4
Protein	...	...	...	...	1.3
Fat	...	...	...	...	3.3
Sugar	...	...	...	...	6.8
Salts	...	...	...	...	0.2

Other constituents of breast-milk, such as vitamins and immune bodies, are not susceptible of measurement, though extremely important to the proper nourishment and growth of the infant.

The *proteins* are of two kinds—(1) Caseinogen, (2) Lactalbumin and Lactoglobulin.

Caseinogen is a protein which is coagulated by acids and by the digestive secretions of the stomach. It is the caseinogen in the milk which forms a 'curd' (casein) in the infant's stomach when acted on by the gastric juice. It is not coagulated by boiling.

Lactalbumin and lactoglobulin are not coagulated by acids or by the digestive juices, but are coagulated by boiling. They are therefore called soluble or non-coagulable proteins. They resemble the proteins of blood serum very closely.

The coagulable and non-coagulable proteins in human milk are present in the proportion of 3 : 2. This fact is important to remember, for, as will be seen later, it is the casein in milk which is difficult to digest.

The *fat* in human milk exists in a state of fine emulsion. The fat globules are uniform in size. Fat is the most variable constituent in human milk. The first part of the milk contains less than the latter part. This fact is visible to the naked eye. The first milk appears more watery, and for this reason mothers sometimes think their milk is of poor quality. At the end of a feed the milk looks more like cream. This can be demonstrated to the mother, to dispel the idea that her milk is not rich enough.

The *sugar* of breast-milk is lactose and is identical with that in cow's milk.

Vitamins A, B, C and D are present in human milk. The amounts depend partly on the diet the mother is receiving. Especially in the case of vitamin D, the milk may be deficient if the mother is not receiving a diet containing the vitamin or if she does not get enough fresh air and sunshine.

Salts of several kinds are present.

The amount of milk secreted by the breast depends on the age of the child, and varies from 10 oz. per day in the first week to about 40 oz. or over at the end of the lactation period.

The first milk secreted is called *colostrum*. It differs from the milk secreted after lactation is properly established. It is yellow in colour and is rich in proteins, which are mainly lactoglobulin and lactalbumin. The purpose of colostrum is a matter that is still not definitely decided. Its close resemblance to the serum of the mother's blood makes it easy to absorb, and therefore it prepares the way for the true milk by providing a substance which educates the stomach and intestines gradually for their functions. The fact that it is secreted in small quantities prevents distention or overloading of the stomach. Colostrum is also considered to be important to the infant, because it contains 'immune bodies' which protect the child against infection.

THE ESTABLISHMENT AND REGULATION OF BREAST-FEEDING

We have seen, and every midwife knows, that the amount secreted by the breast is small at first. This is followed in a few days by profuse secretion. Since the infant is small and weak it neither requires nor can it usually withdraw as much milk as is secreted, and the breast is therefore engorged and painful. To relieve the breasts some milk may be withdrawn by hand or by a breast pump. With a normal, healthy infant this difficulty disappears after a few days. While the breasts are swollen and tense fomentations may be applied to relieve the pain. On no account should the infant be kept from the breast, though the mother may suffer some pain through the attempts to suck. The first lessons in sucking are of great importance to the infant as well as to the mother. Sucking is an instinct, and newly-born infants will suck their own hands and will suck the nipple within an hour of birth. But the instinct must be used or the child will have to acquire it a second time. What happens frequently is that the infant sucks without getting much from the breast, or that he is put to the breast in a clumsy manner, fails to catch the nipple, and so turns away from the breast. In India the infant is sometimes not put to the breast at all for several days. In the West the opposite mistake is made. The child is pressed to take the breast and kept too long at it, with the result that the nipple becomes painful (see above p. 26). The middle way is the right one. The child should be put to the breast a few hours after birth, and then every six hours for the first 24 hours. After that he can be put to the breast either three- or four-hourly, whichever is decided on. If there is very little secretion the first few days, a little warm boiled water can be given, preferably through a bottle, care being taken that the hole of the teat is not too large. A few grains of sugar may be added to the water, if desired. The infant may not suck vigorously at first, sometimes because of prematurity or weakness. If this is the case the breast must be emptied by other means, because unless this is done the best stimulus to the production of milk will be lost. The breast can be effectively emptied by the hand, though a breast pump is usually considered necessary. To remove the milk by hand massage the breast towards the nipple by stroking movements (as described above), and then expel the milk by causing the fingers to contract over the ampullæ, i.e. at the border of the

areola, in a rhythmical fashion. The two movements should be performed alternately. This is a better method than the old-fashioned one of squeezing the breast with the whole hand, and causes less pain in engorged breasts. The mother's intake of fluid may be restricted for a few days if the breasts are much engorged or the child feeble.

The position of the child during sucking is of some importance. Psychologists tell us that there are two things which create fear in the infant at the start of life—loud noises and lack of support. If this is so, it is a guide to us as to how the child should be initiated into the new method of receiving his nourishment. The child in the uterus is fed passively from the mother's blood. The newly-born child has to learn how to take his food for himself, and we must make his path easy. When he is put to the breast first let it be in an atmosphere of calm and quiet. It is not easy to banish well-meaning but curious relations of all kinds from the room, but they are distracting to both mother and baby! At first the mother will be in bed. Show her how to make herself and the infant comfortable, so that the baby will be well-supported and not have to strain for the nipple. The baby should lie on the mother's arm, if necessary on a pillow. The mother lies on the same side as the baby will feed from. The mother may guide the nipple into the child's mouth, and should be quite sure that the breast does not interfere with the breathing. In fat women the breast may be unmanageably large and apt to block the baby's nose. After the lying-in period is over the mother usually prefers to feed the child sitting. The position occupied by most Indian women is the right one, i.e. a low stool without arms. The baby is supported by one arm while the other hand is free to manipulate the breast. This free hand is used in different ways, as circumstances demand. It can hold back the breast so that the nostrils are not blocked. It can regulate the flow of milk by compression of the ducts; and it can expel milk from the ampullæ. With regard to regulation of the flow of the milk, this is necessary (1) when the flow is too rapid and (2) when the infant sucks too greedily. To do this the breast is held in the hand, the nipple being between the first and second fingers. These two fingers should be placed at the edge of the areola. The two fingers are then pressed towards one another, with the

result that the flow from the ampullæ and ducts can be lessened. This is valuable to prevent the baby getting too much milk in either of the above cases. If too much is taken the baby tends to choke and swallow air, and is made generally uncomfortable.

With a feeble or premature infant the fingers are used in another way, that is, to expel milk into the child's mouth. This is done in the same way as is described under emptying the breast, that is by rhythmical compression of the ampullæ. Such an action is of great assistance to the feeble infant in encouraging him to suck.

Such measures may be required in the early days of lactation. Later the infant learns how to manage both swallowing and vigorous sucking himself.

FEEDING INTERVALS

If a mother is asked, at an infant welfare centre, how often she feeds her baby, the answer in most cases is, 'When he cries.' Even if she has learned that the answer that is wanted is, 'Every four hours,' or 'Every three hours,' her actions belie her statements, and if the infant cries her first thought is to give him the breast. She has very seldom any other idea about stilling a cry, even if common-sense tells her that the infant cannot be hungry. The baby himself leads her astray by eagerly sucking the breast. It is certainly an uphill task in India to preach the value of regular intervals for feeding, and we have to use all our ingenuity to make mothers accept the strange doctrine.

Modern teaching about breast-feeding is never tired of emphasising regular and long intervals between feeds, and absence of night feeds. Such teaching is based on the following facts:

1. The method secures the optimum secretion of milk from the breast.
2. It ensures good digestion and good appetite in the infant.
3. It is best and most convenient for the mother.

It is worthwhile to try and understand the point of view of the average Indian mother, and why it is she finds this law so hard to keep.

- (1) In the first place every cry is thought to be due to hunger,

or at any rate every baby can be quietened by one method only, the offer of food. (2) Very few mothers can bear to hear the baby cry, and fathers are only slightly less tender-hearted! (3) Mothers do not comprehend the damage inflicted by irregular feeding to the digestion or the character of the baby. (4) The almost universal habit of having the infant sleep in the same bed as the mother makes the avoidance of night feeds extremely difficult.

One of the first tasks of child welfare centres is to educate mothers out of these ideas. We have to place the real facts before them in such a way that they will be accepted, and use homely illustrations to get our points home. In the first place we must try to persuade them that all cries are not due to hunger. The baby may be uncomfortable, wet or cold, or he may have indigestion, or he may be merely 'spoilt.' Almost every infant, once he has felt the comfort of the mother's arms and the instinctive protection of her closeness, will cry to be taken up. For this reason it is necessary *from the start of life* to accustom the baby to his own cot and not to become dependent on the mother. As will be seen elsewhere, this is a valuable lesson which can be learned easily in infancy, but with pain and trouble later (see p. 124). Mothers must also be made to understand that the act of sucking is in itself pleasurable—witness the fact that sucking of fingers or thumbs (and comforters!) often stops the cry as effectively as the sucking of the nipple. Secondly, the mother has to be taught that a certain amount of crying is not only not harmful to the baby but good for him. It is the only form of exercise for young babies; it develops their lungs and aids the circulation. Thirdly, the mother must be made to understand the bad effect of irregular feeding on the child's digestion and development. With constant small feeds the baby's stomach and bowels are never empty, and there is no rest period. The result is lack of real appetite, and frequently vomiting and diarrhoea. The child is never really satisfied and never really keen on his food. The hurrying of the food throughout the bowel prevents its absorption, and the nutrition of the child suffers. The quality of the milk is not so good. It is complete emptying of the breast by a hungry child which stimulates the breast to secrete milk. Small quantities, taken at frequent intervals, never empty the breast. The child

too, gets the 'fore' milk and not the last milk, which is richest in cream. Night feeds prevent the long rest to the baby's digestive apparatus and the mother's sleep is disturbed. Constant yielding to the infant's demand to suck (not necessarily, be it noted, a demand to feed) means that he forms the habit of securing everything by crying. Irregularity is as bad for the mind of the small baby as it is for the body. Fourthly, the lack of a separate cot for the infant increases the difficulty of avoiding night feeds tenfold. Even a baby which is fed once in the night for the first six weeks or two months, soon drops the habit if he sleeps alone. It is the nearness of the mother in bed which suggests to the infant the desire to suck. And besides, his sleep is more disturbed, and if he cries the soothing nipple is at once at hand to quiet him. More often than not he sleeps with the nipple in his mouth.

The question as to which is better, three-hourly or four-hourly feeds is one that is not finally decided. Generally speaking the longer the interval the better, but each baby must be studied as to his special needs. Small, frail babies will require more frequent feeds. The mother may feel uncomfortable if four-hourly feeds are started from the first. It should be possible, however, to get every normal infant on to four-hourly feeds within a month of the start of life. Night feeds should be avoided from the beginning, if possible. This is largely a matter of training. If the confinement takes place in a hospital the baby is usually trained before the mother leaves. If the confinement takes place at home, the baby may be taken charge of by someone else for the night, and given some warm boiled water if he awakens. Unfortunately, among the poor a separate room is not available for this purpose, and frequently not even a separate bed.

If three-hourly feeds are adopted the feeds will be at 6, 9 a.m., 12 noon, 3, 6 and 9 or 10 p.m. We often notice the expression, 'Feeding by the clock,' in books and articles on child welfare. Such are written for countries where clocks are commoner than in India. What are we to suggest for those who have no clocks? In the first place, the class which has an income of Rs. 75 per month and over should be able to afford a small clock, which can be got for a few rupees. This is an opportunity for the health visitor to influence the husband or father! Let him

be persuaded of the usefulness of a clock—his own meals as well as the baby's may be given at more regular intervals as a consequence! For those of smaller income other methods may be used—the rising and setting of the sun, in a town the hooter of a factory, the school bell, and any other device that offers may be used. Remember that if once the periods are made regular the child will respond more or less accurately.

The duration of the feed varies with the individual baby, some take the feed quickly, others slowly. At first the period occupied in sucking will be long, but when the child is a few months old, and vigorous and hungry, he will empty the breast in a few minutes. No baby should suck for longer than 20 minutes. Mothers, especially primipara, are, however, very often deceived as to what constitutes sucking. They imagine that if the baby has the nipple in his mouth he must be taking milk. This is far from being the case. If the baby is closely observed it may be seen that often he is merely sucking the nipple and not really absorbing milk. When milk is being taken the baby gives a long, steady pull, with strong action of the cheeks, and can be seen to swallow. If he is merely playing, the action is short, quick and superficial, like that of the calf when stimulating the flow of milk from its mother's udder. Some mothers worry because the baby apparently finishes so quickly. They do not realise how fast the baby can suck. If necessary, a test feed can be done to reassure them.

A point on which textbooks are frequently very vague is whether one breast or two should be given. In the beginning, that is, immediately after the baby's birth, the baby should be put to each breast for ten minutes. This is done to stimulate the flow of milk. After the milk 'comes in,' i.e. the fourth to sixth day, the baby will get enough from one breast. It may be necessary, for the mother's comfort, to remove some of the milk from the other breast, either by the hand or by a breast pump. When the great engorgement is past, say 10 to 15 days, the baby can be given one breast only every three or four hours. If the secretion is good, one breast will be sufficient for several months. When there are signs that the baby is not getting sufficient from one breast, the second may be given. Towards the end of lactation the baby may empty both breasts.

Educated mothers sometimes suggest giving the baby one

bottle a day, either 'to accustom the baby to the bottle' or to free them from one feed. It is not necessary to accustom the baby to the bottle, and if the mother wants to give up one feed she is considering her own convenience, and not the baby's rights. Giving up one feed has a bad effect on the secretion of the milk besides.

DIFFICULTIES IN BREAST-FEEDING

Some of these have already been alluded to. They may arise from the side of (1) the mother and (2) the child.

The difficulties on the part of the mother may be (1) local, (2) general, (3) psychological.

Local difficulties are painful or cracked nipples, or breast-abscess. The prevention has already been mentioned. The great point to remember is, that even if the baby cannot be allowed to suck on account of the pain caused, *the breast-milk should be drawn off*. One sometimes sees cases of women who have to depend on one breast because this precaution has been neglected and the breast simply ceases to function.

General difficulties are those which cause a poor supply of milk. Among them are bad management, e.g. irregular feeding and failure to empty the breast; poor health; lack of nourishment, especially foods containing protein and vitamins; too little fluid; lack of rest and sleep; too much work, especially immediately after the puerperium; faulty hygiene, either of the person or surroundings. The general lines to be adopted to combat such difficulties have already been sufficiently dealt with.

Psychological difficulties are mostly confined to patients among the upper and middle classes. *Suggestion* on the part of the patient herself, or on the part of her relatives, is difficult to get over. The most common form is that of a mother who has lost more than one child already during the period of breast-feeding. Though the causes of such deaths are almost certainly *not* due to breast-milk, the patient (or her mother-in-law) puts them down to some quality of her milk, and breast-feeding is, therefore, abandoned. To get rid of such ignorance and prejudice is no easy task, and taxes the powers of the health visitor to the utmost.

Other forms of psychological difficulty are anxiety on the part of the mother that she will not succeed in nursing

her child, and unwillingness to do so for personal reasons. Remember that the feeling of unwillingness may not always be in the patient's conscious mind, and is, therefore, all the more difficult to find out. The health visitor can do much to establish confidence when the mother is lacking in it, and she should also be able to help the unwilling mother by stressing the advantages to the infant of breast-milk, and the ease with which breast-feeding can be carried out, if properly managed.

WET NURSING

If the milk of the child's own mother is not available for him, either on account of her death or inability to nurse or because it is inadvisable for her to do so, the next best source of nourishment is the milk of another woman. This procedure is usually called 'wet nursing.' The milk of another woman has the advantages of breast-milk which have already been mentioned, and, provided certain precautions are taken, the infant is much more likely to flourish on human milk than on that of the cow or goat. Especially in the case of premature or feeble babies, a supply of breast-milk may save the child's life.

Wet nursing was formerly a common practice among the well-to-do. It has become less common recently for two reasons: (1) The difficulty of obtaining suitable wet nurses and (2) the spread of knowledge about artificial feeding, and especially the introduction of dried milks. Good wet nurses are undoubtedly not easy to obtain. If it were realised that many women can completely or partially nourish two infants, it might be possible to obtain the services of wet nurses more easily. It is certainly unfair to put the child of the poor woman on to artificial feeding in order that the rich man's child may be nourished.

There are several points which require careful attention in selecting a wet nurse. These are as follows:

1. The general health must be sound. Especial care must be taken to ascertain that she is not suffering from syphilis or tuberculosis.

2. She must have a sufficient supply of milk. The best test is the state of the woman's own child, but 'test feeds' can also be carried out with advantage.

3. The nipples should be well formed and free from cracks.

4. The wet nurse must have a good character and a calm

disposition. These do not directly influence the milk supply, but the character must be good because the child will largely be trained by the wet nurse, and excitable nervous women are not apt to be good nurses.

5. The age of her own child was formerly thought to be of importance in determining the choice of a nurse. It is now the opinion that age does not matter very greatly, except that the milk of a woman whose child is several months old must be given with caution to a newly-born baby. It can be drawn off, diluted with water, or even peptonized for a few days.

The wet nurse should be treated with consideration, though not overfed or allowed to be idle. The hygiene of her life should be similar to that of the ordinary nursing mother.

Temporary or partial wet nursing may help a baby to get over a difficult time. It is a great pity that there appears to be a prejudice against giving such help to a motherless baby or one whose mother cannot feed him. In hospitals it should always be possible to get some milk for such infants from those whose breasts are overflowing. Many a mother in the home could do like service for a helpless neighbouring infant. Health visitors should do what they can to overcome this prejudice in cases where a supply of breast-milk might just give the needed start to a baby. The milk can be drawn off and given to the baby through a bottle, if preferred or if more convenient.

COMPLEMENTARY FEEDS

In the case of a mother whose milk supply has been proved to be inadequate through weighing, we must first of all try to increase the supply. How can this be done?

1. Increase the mother's diet, giving extra protein especially.
2. Increase the amount of fluid taken by the mother, giving extra milk with meals or extra water night and morning and between meals.
3. More rest; nights must be undisturbed; give the baby to someone else at night.
4. Reassure the mother that the milk will come; make her keen to try.
5. Massage of the breasts; bathing with hot and cold water.
6. Tonics to increase the appetite. Tonics with malt in addition are helpful.

7. Empty the breasts regularly. If the baby is too feeble to do it, then use the breast pump.

8. Lengthen intervals between feeds; give four-hourly feeds. This means the baby empties the breasts better as he is hungrier, and lets the breasts have longer rest interval. If all these fail and the child is still not gaining in weight, recourse must be had to *complementary* feeding. In cases of this sort, never advise the mother to leave off one feed and substitute for the breasts cow's or dried milk; by doing this the stimulus to the breasts to secrete is lost, namely, the emptying of the breasts by the child. What we must do is to add to the breast milk a sufficient amount to make up a full feed. Ideally this should be done by weighing before and after feeding. (Test Feeds.) This is, however, usually not possible. Hence we must fall back on prescribing a small quantity of extra milk at the same time, when the supply seems deficient. This is usually in the afternoon or evening. This must be checked by careful weekly weighing. Never give the child more than just enough to secure the required increase in weight. Never give the complementary feeds first. Always give the breast first and let the baby thoroughly empty both breasts. Then give the complementary feeds.

Example. A baby, $4\frac{1}{2}$ months old, birth weight $6\frac{1}{2}$ lbs., gained for the first three months; at the beginning of the fourth month weighed $10\frac{1}{2}$ lbs.

During the next four weeks the gain was 3 oz., 2 oz., 2 oz., 1 oz. Baby is not ill, stools normal, cries a lot. Mother is given advice as above; next two weeks gained only 1 oz. per week; obviously the mother has insufficient nourishment. Advise the mother to give (with either bottle or cup) 3 oz. extra ($\frac{1}{2}$ milk and $\frac{1}{2}$ water) twice a day. Baby is on 4-hourly feeding (6, 10 a.m. 2, 6, 10 p.m.). Give the baby extra feed after the 2 and 6 p.m. feeds. Try this for two weeks; if baby has gained 4 to 5 oz. go on with this. If the gain is below 4 oz., then give another complementary feed at 10 p.m. also, and watch the result for two weeks more. If satisfactory, go on with the three complementary feeds. If gain still not sufficient, increase the amount of complementary feeds.

It is very important for every baby, and especially so for delicate babies, to get as much mother's milk as possible up to 8 to 9 months. The milk will be secured to the baby by means

of complementary feeds. If breast-feeds are left out and whole feeds of cow's milk given instead, the breast supply gives out and the baby has nothing to fall back on in case of sickness. If complementary feeding is carried out, there is always some breast-milk to fall back on, which is a great asset.

WEANING

Weaning means removing the child from the breast, or accustoming him to other forms of nourishment than mother's or other breast-milk. In English textbooks it is usually recommended that weaning be carried out when the child is nine months old. At this age one feed of breast-milk is replaced by a feed of cow's milk (fresh or dried). After an interval of a week another feed is replaced, and so on, till the baby is being wholly fed on cow's milk. At the same time starches are introduced, if this has not been done earlier. The amount of the feeds can be calculated in the same way as when artificial feeding is carried out. If the child has a digestive upset, breast-milk should be again resorted to. When weaning has been completed, fresh experiments in new foods can be tried, other forms of carbohydrates added to the diet, protein in the shape of eggs, *dals*, and, gradually, fish, chicken and mutton. At two years the child can eat any simple food, approximating to a sensible diet for an older child or adult. Milk should, however, always form part of the diet.

Unfortunately, this comparatively simple method of weaning is seldom put into practice in India. Breast-feeding is carried on till the child is much older than nine months, for reasons we shall notice presently. In addition, the season of the year often makes weaning difficult and dangerous, as it is not advisable to make such a change in the middle of the hot weather or the rains.

Welfare workers cannot but notice that babies who flourish for the first 8 to 10 months of their lives often show a marked falling off at this age. The babies cease to gain weight and look thin and anæmic. It is not at all uncommon for babies who weigh 15 lbs. at eight months to weigh little more at the end of the second year. After that they begin to pick up again. What is there to account for this arrest of progress? The most frequent cause is the failure to give the child the nourishment he should have at this age. When one questions the mother of

a child, 12 to 18 months or even 24 months, about the feeding, she will often say that the child eats a little solid food, but continues to take the breast. The solids which he takes are not specially prepared for him, and are neither easily digested nor assimilated. He frequently absolutely refuses to take cow's milk at all.

Now it is plain that were we to insist on weaning at nine months, many children would have to do without milk at all. Milk is not cheap and cannot be afforded by many in sufficient quantities. Far better continue the breast than deprive the baby of milk. Besides, there is no harm in continuing to breast-feed the child, *provided other foods are added to the diet*. To secure this it is necessary to begin early. A child should begin to have some starch at seven months, and it should be given from a spoon or cup. If given at this age the child can easily be taught, whereas if we wait till he is 15 months old he will certainly refuse the strange food, and object to the manner in which it is given. *Suji* is one of the best forms of starch to start with, but rice (ground) and barley may also be used. The cereal may be cooked in half water and half milk, and sugar added. Small quantities can be given at first and increased gradually. After such a feed a drink of breast-milk can be given (never before!).

Another necessity is some form of hard food for development of the jaws and teeth. Hard biscuits, rusks, toast or crusts are suitable. The baby does not swallow much actually, and the purpose is rather to exercise the jaws than provide food.

For a baby of 11 to 12 months a diet somewhat as follows is normal:

6.30 a.m.	Milk, 6 to 8 ounces; sugar, 1 teaspoonful.
10 a.m.	Milk, 4 ounces.
	Rice and <i>dal</i> ;
	or
	Baked potato and <i>dal</i> soup;
	or
	<i>Kichri</i> ;
	or
	A lightly-boiled egg and bread and butter.
2 p.m.	Milk, 6 to 8 ounces.
	Sugar, 1 teaspoonful.
	A slice of toast with butter, or biscuit.
	Baked apple (a little) or fruit juice.

- 6 p.m. Milk, 4 ounces.
 Sago, *suji*, ground-rice or groats, $\frac{1}{2}$ ounce.
 Sugar, 1 teaspoonful.
- 10 p.m. Milk, 4 ounces.

During the course of this time the drink of milk at 10 p.m. should be gradually stopped. The baby can well do without it. Towards the end of this period vegetables can also be gradually introduced. The best way to give them is in soup; carrots, turnips, vegetable marrow, spinach can be added in small quantities to the soup. The vegetables are best steamed, and can be strained at first. The soup can be made with meat or with *dal*, and taken with potato, which is best baked as above.

The diet of children from one to three years of age does not differ materially from the last given, except in quantity. It would be somewhat as follows:

- 6 a.m. Milk, 6 ounces.
 Toast or hard biscuit with butter.
 Fresh fruit.
- 10 a.m. (1) *Suji daliya* (cooked with milk).
 (2) *Kichri* and vegetables; or rice, *dal* and vegetables;
 or *dal*, *chapati* and vegetables.
 (3) Water to drink.
- 2 p.m. (1) Milk or *dahi*, 6 ounces.
 (2) Hard biscuit or toast and butter.
 (3) Wholesome sweets, a small quantity.
 (4) Fruit—fresh or cooked.
- 6 p.m. (1) Rice and *dal*; or
 Khir (without nuts or raisins); or
 Sago boiled with milk and sugar; or
 Bread and milk; or
 Dal soup with potato or toast.
 (2) Water to drink.

In the case of non-vegetarians, fish, mutton, chicken and eggs can, any of them, be given in turn at the 10 a.m. meal, instead of *dal*. Soup made from meat of chicken or mutton can be given, with potato or bread, at the evening meal. As above, water should be given in plenty.

CHAPTER V

ARTIFICIAL FEEDING

If a baby cannot be breast fed we have to look for a substitute for human milk. No other milk is exactly the same, either in its composition or its results on the baby. Our aim is to modify the milk to make it as like human milk as possible.

The common substitutes for human milk are cow's milk or goat's milk. The percentage compositions of the three can be seen side by side in the following table :

COMPOSITION OF HUMAN, COW'S AND GOAT'S MILK¹

	WATER	FAT	SUGAR	PROTEIN	CASEIN	SALTS
Human ...	88.4%	3.3%	6.8%	1.3%	0.9%	0.20%
Cow's ...	87.32%	3.75%	4.78%	3.40%	3.00%	0.75%
Goat's ...	86.04%	4.63%	4.22%	4.35%	3.49%	0.76%

Goats are easy to keep and do not cost much to feed. For those who cannot afford to buy good milk or keep a cow and who have space to keep a goat, it is a good method of meeting the infant's milk requirements. The goat yields an average of two or three seers a day, and stays in milk for three months. The methods of modifying goat's milk are similar to those for cow's milk. Buffalo's milk has too high a protein and fat content to be suitable for infants. Ass's milk resembles human milk more closely than that of other animals, but is not often obtainable. Cow's milk is, therefore, the milk we have to consider in detail.

Cow's milk can be given to the infant in a variety of forms, either as fresh cow's milk suitably modified, or as a dried or condensed milk made up with water, or as an infant food, in

¹ Richmond, H. D., *Dairy Chemistry*, 1930.

which case milk which has been dried has other substances added to it.

Most authorities are agreed that the modification of fresh cow's milk is the best method of infant feeding. Under certain circumstances, which will be noticed later, dried and condensed milks are advisable.

A study of the table given above will show that modification of cow's milk to make it resemble human milk is a complicated process. To make cow's milk resemble human we have to take away more than half of the protein, while at the same time we have to add sugar. We have also to decide the total quantity of fluid the infant has to get, the caloric value of any mixture we make, and how such essentials as vitamins and salts and immune bodies are to be given in adequate amounts. Our difficulties do not end here. The protein of cow's milk is composed largely of insoluble caseinogen (six parts to one part lactalbumin), whereas in human milk lactalbumin predominates (two parts of lactalbumin to one of caseinogen). The fat of human milk is in a finer state of emulsion than cow's milk, so is more easy to digest. Finally it is difficult to secure that cow's milk in any form is given to the infant exactly at the body temperature and is wholly free from germs. In face of all these difficulties, it is not surprising that many different methods of giving cow's milk are advocated, and each method has certain advantages while it also has its drawbacks.

We shall examine some of the common methods of giving cow's milk shortly. It must always be remembered that no method meets with universal success, that many infants thrive, in spite of what is apparently wrong feeding, through their power of adaptation, and that each baby is an individual whose particular needs and peculiarities must be carefully studied. Before giving the details as to the various methods, it is well to examine the child's theoretical needs as based on what he receives from breast-milk. The *quantity* in fluid can be gauged by determining the whole 24 hours' supply of a breast fed child, since the amount varies at each feed. But the amount of breast-milk secreted increases with the growth of the child, so that it is best to know what amount of milk an infant requires per pound of body weight. We can then apply the figure to a child of any weight. It is usually reckoned that an infant gets about $2\frac{1}{2}$ oz.

of breast-milk per pound of body weight per day. This is taken as a standard in making up any form of cow's milk. Example: a baby weighs 12 lbs., amount of fluid required— $12 \times 2\frac{1}{2} = 30$ ozs. per day. Divide this amount by the number of feeds the child gets per day, and we know the amount of fluid needed at each feed, i.e. for five feeds 6 ozs. at each feed. Of course, extra water, given separately, is desirable and often necessary, just as in the case of breast fed infants.

Reckoning the total fluid required in this way according to the weight of the child is much more scientific than according to age. It has to be remembered, however, that in artificial feeding from birth we have to take into consideration the manner in which the milk takes a few days to form in the breast so that the infant gets small feeds at first. Nature in this way provides for the gradual accustoming of the infant to food in the stomach and the gradual dilatation of that organ. For example: suppose an infant is $6\frac{1}{2}$ lbs. at birth. According to the above calculation he would get $2\frac{1}{2} \times 6 =$ total 15 ozs. of fluid, that is, 3 ozs. in each of five feeds. We would not, however, start a newly-born baby on 3 ozs. at a feed, but gradually work up to this from 1 oz. per feed at first till he is able to take 3 ozs. at a feed at the end of a week or ten days.

The other thing to be decided is the number of calories a child needs per pound of body weight. This varies from 40 to 60 calories per pound of body weight. The variation depends on the state of nutrition of the child, its activity and the temperature of the air. Hence babies which are thin, active and cry a lot, and those living in a cold climate, need more calories to make up for the energy expended and to enable them to lay down fat and keep warm. The plump, placid kind of baby, and those living in warm places, need fewer calories per pound of body weight. The average number of calories required for a baby is 45 calories per pound of body weight per day. Thus a child weighing ten lbs. requires $10 \times 45 = 450$ calories per day. We have to see that whatever mixture of milk we give approximates to this standard. We must further remember that the calories must be derived from protein, carbohydrate and fat in about the same proportion as in breast-milk. Some authors lay a great deal of stress on this. The proportion which the calories derived from protein bear to those derived from carbo-

hydrates and fat together is usually called the 'protein ratio.' In the case of human milk it is 1 to 10 or 11, and in the case of cow's milk 1 to 4 or 5.

We are now in a position to examine some of the common methods of infant feeding.

1. *Simple Dilution with Addition of Sugar*

This is the simplest method of infant feeding. If we dilute cow's milk with an equal quantity of water we get a mixture which has about the same amount of protein as breast-milk. Sugar and cream or cod-liver oil are added to make up the sugar and fat lost by dilution.

Example: Baby, 10 lbs. Fluid required $10 \times 2\frac{1}{2} = 25$ ozs. daily (five feeds of 5 ozs.). Of this $12\frac{1}{2}$ ozs. is milk $= 12\frac{1}{2} \times 20 = 250$ calories. Calories required for a baby weighing 10 lbs. $= 10 \times 45 = 450$ calories. Extra calories required in sugar and fat are, therefore, 200 calories. 1 oz. sugar $= 120$ calories, leaving 80 calories for cream or cod-liver oil. Since 1 oz. of 50 per cent fat cream $= 120$ calories, about 6 teaspoons or $\frac{3}{4}$ oz. cream would supply the fat, or $2\frac{1}{2}$ teaspoonfuls of cod-liver oil. In actual practice a larger quantity of milk is often used. A commonly recommended dilution is milk $1\frac{1}{2}$ oz. with 1 oz. water added. In this case rather less sugar and fat are needed. This is the simplest method of diluting milk. It is advisable when the mother is poor and not very intelligent. Many infants do well on such a mixture.

2. *Humanised Milk*

By this is meant a diluted milk prepared in a more elaborate way than the former. In some humanised milks, whey is used as well as milk ('split protein'), in order to increase the amount of soluble protein (lactalbumin). Lime water is also used partly to make the milk more alkaline. Mixtures of sugars may also be added (dextrose, maltose and lactose) and artificially prepared fats, such as New Zealand cream.

Humanised milk has been popularised through the writings of Dr. Truby King. Its great advantage is in the case of delicate babies or for the first two or three months of life in an infant which has to be bottle fed from the start.

The following is an example of a mixture recommended for a baby under three months:

Milk	12 ozs.
Lime water	$1\frac{1}{2}$ ozs.
Sugar	$1\frac{2}{3}$ oz.
Cod-liver oil emulsion	1 ozs.
Water to total	30 ozs.

The amount of the mixture taken would, of course, depend on the age and weight of the child. For further details about humanised milks books on infant feeding must be consulted.

3. *Undiluted Cow's Milk or Whole Milk Feeding*

This is advocated by some writers. Many infants do well on whole milk after a very few months, and some even from birth. It should be remembered that infants who are fed on a full cream dried milk are really being fed on whole milk unless the dried milk is modified.

Each of these methods has advantages and disadvantages, some practical and some theoretical.

Diluting the milk, either by simple dilution or in making humanised milk, means that some of the salts and immune bodies and some of the vitamins are lost. Further, the *proportion* of the soluble and insoluble proteins remain the same, though the total protein is reduced in amount. Dilution reduces the fat and sugar. The latter can be fairly easily replaced, but to add fat to a mixture is difficult. Cream is likely to be highly infected and cod-liver oil is expensive. In giving whole milk we give the infant too much protein, and the bulk of it in a form (caseinogen) which is difficult to digest since it forms large tough curds in the stomach. We also have to give the child an excessive amount to make up the total fluid required.

Whole milk and diluted milk with added sugar and fat are fairly simple to prepare. Humanised milk is difficult to prepare and almost impossible in the home without trained help.

Dried Milks have several advantages. They are practically sterile, and therefore safe from the point of view of infection; and they are very easy to prepare. The protein is somewhat easier to digest than in fresh milk.

On the other hand, they are lacking in vitamins, and, unless modified, contain too much protein. They are also more expensive than fresh milk. They are very useful for those who can afford them, especially in very hot weather or during the rains. It is best to dilute them for young infants, adding sugar and cod-

liver oil and giving fresh fruit juice to supply vitamins. Some firms have made up 'humanised' dried milks, e.g. Glaxo, Cow and Gate. They are easy to prepare, but expensive.

Condensed Milk. There are two kinds—sweetened and unsweetened. The former contains an excess of sugar and too little protein and fat. Both are of use in certain cases, as we shall see later.

In both dried and condensed milks the easiest way to calculate the amount required is to mix the dried or condensed milk with the amount of water which will reconstitute fresh cow's milk, and then modify the milk as above.

THE DIGESTION OF PROTEIN

We have seen that it is the tough large curds of cow's milk which render it difficult to digest. There are various ways in which this difficulty can be got over, and it may be necessary to use these in the case of delicate infants.

1. *The Use of Whey*

As has been noticed, whey is used in making 'humanised' milk. If pure whey is used the infant gets no caseinogen, but only lactalbumin. Pure whey has the following composition: Protein 0.9 per cent, Carbohydrate (sugar of milk) 5.6 per cent, Fat 0.34 per cent. It is thus a solution of sugar containing a small amount of protein and a very little fat. It is useful after an attack of acute indigestion. No infant should be kept long on whey as a food, for, apart from its lack of fat and small amount of protein, the stomach must be accustomed to digest caseinogen, and this cannot be done if whey is the food given. The best way is to replace increasing amounts of whey by milk in the feeds.

Whey is made by the action of rennet on milk, but unboiled milk must be used, which is a disadvantage in India. A form of dried whey has been made known as 'Secway,' and 'Albulactin' is soluble milk protein.

2. *Acid Milk*

This has become popular lately. It is made by adding lactic acid to cow's milk (45 drops to one pint of milk added slowly, stirring all the time). It can also be obtained as a dried milk, 'Lacidac,' made by Cow and Gate, Ltd. The additional acid

in this milk makes up for lack of hydrochloric acid in the gastric juice. It produces a soft, flaky, acid milk, which is useful for premature infants and in fermentative diarrhœa.

3. *Alkali Milk (Citrated Milk)*

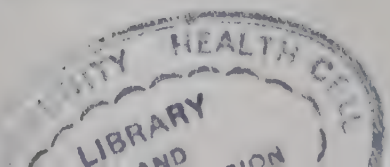
In this case the process is the opposite to that of acid milk. Adding sodium citrate to the milk delays, or prevents altogether, the coagulation of the milk. It does not make the milk more digestible, in fact, it prevents the process of digestion starting in the stomach, digestion therefore has to take place in the bowel. Addition of sodium citrate to milk is rather popular, probably because, owing to the delay in coagulation of the milk in the stomach, it is not vomited, and the mother or nurse therefore thinks the food is agreeing perfectly with the infant. On the other hand, for this very reason citrated milk is useful in the case of infants with irritable stomachs who tend to vomit frequently. Vomiting sometimes becomes a habit, and if the habit can be broken by suitable measures, such as the use of citrated milk for a short time, then the former diet can be returned to later and the citrate given up.

4. *Peptonization or Predigestion*

Although we usually use the term, 'peptonization' of milk, the process is actually 'pancreatizing.' Peptonizing powders and Benger's Food both contain pancreatic extract, which acts on all the constituents of the foods. (Peptonization would only mean that the protein was acted on.) If milk is peptonized it is obviously much easier for the child to digest. It is, therefore, a very valuable help for delicate or premature infants, or in recovery from an illness. Both fresh and dried milk can be peptonized. The process may be carried out either by the use of peptonizing powders (Fairchild's) or by the use of Benger's Liquor Pancreaticus. Dr. Eric Pritchard is of opinion that the work of predigestion should be allowed to go on for a much longer time than is usually supposed. He suggests beginning with a long time of peptonization, say three hours, and reducing the time gradually five or ten minutes a day.

Benger's Food can also be used for predigesting milk. In Benger's Food pancreatic extract is mixed with 'flour ball.' 'Flour ball' is flour which has been boiled for eight hours and

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then baked dry, by which process the starch becomes dextrinised, that is, partly changed to soluble carbohydrate. Benger's Food added to milk thus increases the carbohydrate value of the feed. It is a very valuable food for delicate children and those recovering from illness. It requires care in preparation.

5. *Cereal Decoctions*

By this is meant dilution of milk with weak solutions of cereals. The most commonly used is barley water, but flour (as flour ball especially), oatmeal and rice can also be used. The action of a cereal decoction on the caseinogen of the milk is to form a light, finely-divided curd, which resembles the curd of human milk. Cereal decoctions have the further advantage that they provide the infant with a small amount of starch, and thus help to develop his powers of digesting starch. This power is now thought to be capable of development sooner than was previously thought, and some authors advocate giving small quantities of starch at an early age for this reason.

All these processes of milk modification (unless possibly the use of cereal decoctions) should be regarded as temporary measures to tide an infant over a difficult time. If the infant is kept for too long on any of them, he does not get the chance to develop his own powers of digestion.

THE DIGESTION OF FAT

It is generally held that it is the fat in artificial feeding which causes most difficulty in digestion. We have seen what the differences are between the fat of human milk and that of cow's milk. 'Excess of fat' in the diet may not mean that an infant is being given a diet which contains a greater proportion of fat than that of human milk, but that the infant is unable to digest a similar amount of fat in cow's milk. Excess of fat may simply mean excess for the particular infant we are considering.

Too much fat may cause the stools to be either loose or constipated. In the latter case they are hard, brittle or crumbly, and irritating to the bowel, so that the infant is uncomfortable and peevish. Loose stools due to excess fat are pale in colour, greasy and have a 'cheesy' smell. Excessive fat also often causes vomiting in infants.

There is no known method of making cow's milk fat more

digestible. If the indications are that the infant cannot digest the full amount of fat we have no alternative but to reduce it, and subsequently slowly restore the correct amount. The replacement of cow's milk fat by artificial mixtures, such as New Zealand or Marylebone cream, is scarcely possible in India owing to their high cost.

Since fats and carbohydrates are both 'fuel foods' we might replace fat by extra carbohydrates. Most authorities agree, however, that the child's nutrition suffers if this is done. It is interesting to note that in breast-milk the relation of fat to carbohydrate is in the proportion of one to two. As Dr. Pritchard points out, so long as the infant can digest fat in this amount we should imitate nature. It is a fact, however, that most artificially fed infants can digest carbohydrates better than fat.

THE DIGESTION OF CARBOHYDRATES

In the early months of feeding an infant brought up on artificial feeding, sugar is the form of carbohydrate to be considered, later on insoluble carbohydrates are added.

Formerly bottle fed infants were given sugar in the form of lactose. It is now held that lactose has no special advantage over cane-sugar for healthy infants, and it is much more expensive.

Excess of sugar in the milk leads to frequent, watery, acid, frothy stools, which excoriate the buttocks. Too little sugar is characterised by constipated stools and stationary weight.

When too much sugar has caused diarrhoea the amount should be lessened. Citrated milk may also be used, since it makes the stools more alkaline. Another method is to give simpler sugars or foods containing them, e.g. Horlick's Malted Milk and Mellin's Food, both of which contain dextrimaltose.

With regard to starch the tendency nowadays is to add starch to an infant's food much sooner than was formerly the case. Digestion of starch appears to begin sooner than six months, which was previously stated to be the earliest date at which starch should be added to the food. Many authors recommend small quantities of starch as early as three months. It is often possible to give some carbohydrate in this way when the full amount could not be given as sugar. Starch, as we have seen, is also helpful in the digestion of protein (cereal decoctions).

Starch takes longer to digest, and therefore satisfies the infant better.

In artificial feeding the same regularity must, of course, be observed as in the case of breast-feeding. In the case of infants artificially fed from birth the feeds can be three-hourly at first and changed soon to four-hourly, unless the baby is small or delicate. Increases in the quantity of the feeds should be made gradually and in small amounts, according to the infant's weight.

BOTTLE-FEEDING

When artificial feeding is begun at birth or has to be resorted to in infants under five or six months of age, the milk is best given through a bottle. To spoon feed a small infant successfully is difficult. The milk gets cold easily and much of it is apt to be spilt. The infant's jaws are not exercised by tugging at the teat and sucking. The one advantage of spoon-feeding is cheapness and this is an advantage to the parent, not the baby.

Feeding bottles should be simple in construction, with no corners where stale milk can lodge. The teat should fit over the neck of the bottle, a valve is not necessary. A long tube should never be attached to the teat, as in old-fashioned bottles. (*N.B.* These long-tube bottles are so dangerous that a law has been passed against their use in France.) The hole in the teat should be quite small unless the baby is very weakly. Unfortunately, the hole soon becomes too large, consequently the teat should be changed frequently. It can be tested by holding the bottle upside down and observing the rate at which the milk drops out. It should be about one drop a second. If the hole is too large the child gets the milk too easily and takes it too quickly. In addition, he does not get the same good exercise for his jaws as when the hole is small. In the teat we try to imitate the mother's nipple, and it should be remembered that the milk does not flow easily out of the breast, but has to be sucked out by vigorous action on the part of the child. The teats should be capable of being turned inside out for cleaning. They should be scalded once a day by having boiling water poured over them, and after each feed they should be rinsed outside and in and rubbed with common salt, then dried and put in a covered jar. The bottle must be held by the mother

or nurse *all* the time the baby is feeding. If the baby takes his feed slowly, and the milk gets cold, he may refuse to finish the bottle, even though not satisfied. A good plan is to have a bag of flannel made as a cover for the bottle, which will prevent the milk getting cold so quickly. Of course, it must be washed frequently and kept perfectly clean.

PRECAUTIONS IN THE USE OF FRESH MILK

Since fresh cow's milk is the most commonly used infant food, a few words are necessary about its care.

In towns in India the milk supply is very bad. The cows are kept in an unhygienic way. The stable is generally not clean, and the air dust-laden, flies abound, and a latrine may be found in the near neighbourhood. The udder of the cow is not washed before milking, nor does the milkman wash his own hands adequately, if at all. The milk is usually received in a vessel which is not sterile, nor is it stored in places where the temperature is kept low. No more care is taken in villages, but there the danger is not likely to be so great, as the milk goes more directly from the cow to the consumer.

Generally speaking there is just as little provision for the proper keeping of the milk in the home as there is for the proper care of the cows in the stable. Milk is kept in open vessels and hot places; the vessels are not adequately clean, or they may be washed with infected water. In addition to all these ways in which milk may be contaminated, there is only too frequently deliberate adulteration on the part of the milk-sellers. Water is added to the milk to increase its volume; the cream may also be removed. Substances such as starch, flour, gum and chalk are added to the milk to deceive the consumer, and the milk of cows, buffaloes and goats may be mixed. Preservatives are sometimes added to the milk to prevent it going bad, such are formalin, boracic acid, salicylic acid.

In order to reduce the dangers from artificial feeding we must secure :

1. That the milk is supplied, as far as possible, sterile to the consumer.

2. That it is kept properly in the home.

As regards the first point we may note the following :

1. Stables should be properly constructed, i.e. with proper

ventilation and drainage and *pukka* floors, and they should not be in the neighbourhood of latrines.

2. The cows or other animals must be properly groomed and washed, and grazed in the open air.

3. They must be free from disease, general or local.

4. The milkman's hands and the cow's udders must be washed in water and an antiseptic before milking. The milkman must himself be healthy.

5. The receiving vessels must be scrupulously clean, and sterilized before use by boiling or treating with steam. They should have well-fitting covers.

6. The milk should be delivered to the consumer as soon as possible, and till then should be kept as cool as possible, on ice in hot weather.

It is obvious that these conditions can only be carried out if a very thorough system of milk inspection exists, also laws penalising the persons not observing the regulations.

The care of milk in the home must be an important part of any advice on the subject of artificial feeding. The milk should be boiled when it is received from the milkman. It should be stirred while being brought to the boil, as then a skin will not form and the cream will not rise to the top so quickly. After the boiling the milk should be cooled as quickly as possible. Warm milk is an excellent breeding ground for micro-organisms. The milk can be cooled by placing the jug containing it in running water for half an hour. If running water is not available, then the jug can be placed in a vessel containing cold water which is changed several times. After cooling it is best placed on ice in hot weather. Failing that, the jug may be placed in a wide vessel containing water. Over the jug are placed two thicknesses of gauze or muslin, which dip into the water all round. This is very effective for cooling in the dry heat, owing to the amount of evaporation that goes on. The milk should be kept in a *dooli*, in as cool a place as possible, and not near a rubbish heap, drain, etc. All bowls, jugs and other vessels used for milk must be kept scrupulously clean. When emptied they should be rinsed out with cold water, and then with boiling water and soda. Any utensils used in preparing the milk for the baby, such as spoons, measure glass, etc., must also be so cleansed. The baby's bottle should be boiled once a day.

The milk for the next feed should never be kept ready warm in the bottle, this encourages the growth of bacteria in it. The milk should be kept as cool as possible, and only the amount required for the next feed heated before use.

The *diseases* spread by milk are various. First we have gastro-enteritis, as shown by diarrhœa and vomiting, caused by sour or infected milk. Cholera, enteric fever, and diphtheria are spread through milk having been adulterated with infected water, or through the vessels having been washed with such water. Tuberculosis spreads through infection from the cow. Malta fever organisms may be present in the milk of goats suffering from that disease. Local disease of the udder may infect the milk with staphylococci and streptococci. Lastly, the infant may be upset through the cow having eaten certain herbs or too much wet grass (in the rainy season).

TESTING OF MILK

The usual household test is the lactometer. This indicates the specific gravity of the milk, and is a good rough test. Milk from which the cream has been removed has a high specific gravity. By watering the specific gravity may be brought to normal. Therefore, in addition to the lactometer, it is well to use a cream gauge. This is a graduated cylinder in which a specimen of milk is allowed to remain for 24 hours, and the volume of the cream is then read off. Since the proportion of fat in cream is 3 to 5, the total amount of fat in the milk is $\frac{3}{5}$ of the figure on the cream gauge. The tests for proteins and carbohydrates in exact percentages are too elaborate for ordinary use. When milk is suspected of being deficient in any constituent it can be sent to a laboratory for analysis. The same holds good for bacterial infection.

CHAPTER VI

THE PREMATURE BABY

INFANTS born after they are *viable*, that is, after the 27th week but before the 40th week or full term, are said to be *premature*. It is a very difficult matter to rear an infant at this age, but every week of intra-uterine life makes the chances better, so that babies born between the 32nd and 36th week have a fair chance of life. It is usually considered that an infant weighing under five pounds at birth should be regarded as premature, whether born before the 40th week or not.

CAUSES OF PREMATUREITY IN INFANTS

In many cases the cause is undiscoverable. Some cases are due to syphilitic infection, some follow the toxæmias of pregnancy. Anæmia in pregnancy is a cause where that disease is common. High fevers, e.g. malaria, frequently bring on premature birth. Accidents or shocks, physical or mental, also induce it. Twins are frequently premature. It can be easily seen that many of these causes are preventable. Their prevention can, of course, be accomplished by efficient antenatal care.

SIGNS OF PREMATUREITY

The characteristics of a premature baby are smallness in size, lack of subcutaneous fat, which causes the skin to be wrinkled and the face wizened, redness of the skin, and feeble movements. In addition, the nails do not reach the tips of the fingers or toes, lanugo, or fine hair, is present on the face and body, the sutures of the head are wide and the veins prominent, the weight and height are below normal. The premature baby is subject to great changes of body temperature, breathing is irregular, and the powers of digestion and absorption are feeble.

Consideration of these anatomical and physiological peculiarities leads one to realise in which directions premature babies need special care.

Lack of subcutaneous fat and feebleness of the heat-regulating mechanism mean the need of maintaining the body heat of

the child by external means in cold weather. The lack of power to digest and absorb food means that both the kind of food and its quantity have to be carefully studied. The general feebleness means that the child must be protected from fatigue and from infection. How are these conditions to be achieved?

MAINTENANCE OF BODY HEAT

This perhaps is the most important consideration. In the uterus the infant is surrounded by a fluid which is at a constant temperature. We have to attempt to imitate this condition. In hospitals incubators are sometimes used. In an incubator the child is kept in what is practically a box, so arranged that the air entering is warmed by a lamp. These are not practicable except in hospitals, and even there they are not much used now. In the home an efficient substitute can be designed. A box or a basket can be used. If the latter, it can be lined with newspaper or brown paper. The box or basket must be placed on a stand or on two chairs, not on the floor. If it can be surrounded by a screen, so much the better. The plan described elsewhere, of a blanket which passes under the mattress and is folded over the top of the child, is best for premature babies. Three hot bottles should be provided, one for the foot of the bed and one at each side. They must be frequently refilled, and, of course, not allowed to touch the baby directly. If the health visitor is called to assist at a case where a premature baby is expected, she should make these preparations at once, using the materials she finds at hand. The birth is not likely to present difficulties, so it is essential to use the time to make ready for the frail infant. The bottles, etc., should be placed ready in the cot, and a piece of soft material warmed to receive the baby. As soon as it is born and the cord cut, and it is seen that the child has breathed properly, it should be placed in the cot and left there, only being examined occasionally to see that the cord does not bleed and the infant is breathing properly. The infant should be left thus for at least six hours, it can then be taken out and oiled all over with warm olive or sweet oil. This must be done in a warm place as quickly as possible. The baby can then be wrapped either in cotton wool or a jacket cut out of gamgee tissue. The head should also be covered, and the arms, hands, legs and feet. Pads of cotton wool can be placed

under the buttocks, and changed when wet or soiled. The infant should always be put to lie on the side, and the position changed at each feed.

Though the room temperature must be kept up, air must *never* be excluded.

The infant should not be taken out of the cot except when being oiled or fed. The oiling need not be done daily at first if the infant is very puny, and even the feeding can be done in the cot if the child cannot suck. In this way the child need not be exposed to changes of temperature.

What has been written above applies to cold parts of India, or the cold weather of North India. Summer heat offers as great difficulties to the premature infant as cold, particularly the scorching dry heat of the plains. We have noticed that the infant in the uterus is surrounded by a fluid at an even temperature. It is perhaps more difficult to secure this for the prematurely born infant in hot weather than in cold. The air may be cooled by means of *kaskas* tatties, ice and fans, but these have their dangers, too, as they may induce too great a fall of temperature. The sudden changes of temperature in the rains are likewise dangerous to the premature baby.

It is helpful to take the temperature of the infant frequently, preferably in the rectum.

FEEDING

In feeding a premature baby we have to remember that while the digestion is feeble at first, such a child needs an extra number of calories per pound of body weight. This latter must be reckoned as 60 calories. Our object, therefore, is to proceed cautiously on account of the feeble digestive powers, while aiming at giving the child the maximum dictated by the weight.

Breast-milk should be given whenever possible. The chances of surviving are very much greater if the infant can have breast-milk. Since the mother's milk is not present in sufficient amounts at first, milk from another nursing mother should be obtained. This is usually possible in a hospital, but it is not impossible even in the home. Only three or four ounces are required. If milk is got from another mother, it should be boiled before use, and mixed with $2\frac{1}{2}$ per cent glucose solution. If glucose is not available, cane-sugar can be used, but it should

be strained through muslin after the solution is made, and then boiled. The dilution should be one part milk and two glucose or sugar solution for the first few feeds, then equal parts, so gradually increasing the amount of breast-milk till the infant is on breast-milk only, and this stage should be reached in two weeks. Of course, with proper care the mother herself will be able to supply the breast-milk after a few days.

At first feeding by a spoon or a pipette is advisable, because the child is too weak to suck, and also because it can be fed in the cot and so handling and exposure to cold are lessened. When it is gaining strength it can be allowed to suck for a few minutes at one or two feeds, the remainder of the feed being given by spoon or pipette. Gradually the number of feeds taken at the breast can be increased and the length of time the infant sucks, so that finally it takes all nourishment from the breast. During the period when the milk has to be expressed from the breast this must be done completely, to provide the necessary stimulus to further secretion.

The *amount* of each feed must be very small at first, not more than one teaspoonful. The amount is gradually increased as it is seen that the baby can digest and absorb it. This is judged by the condition of the stools, the absence of vomiting and the increase in the infant's weight.

The *number* of feeds must be increased above the normal, since the infant is taking very small amounts and cannot feed for long. Three or four feeds may be given in the first 24 hours, giving nothing the first six hours. Then feeds may be given every two and a half hours. Night feeds will have to be given at first but they should be gradually left off, and the interval between the feeds in the day increased to three hours.

If *artificial feeding* has to be resorted to the case is very difficult. Every effort should be made, therefore, to secure breast-milk, even if only for a few weeks. If cow's milk is given it should be peptonized, or treated with lactic acid. Alternatives are whey, only gradually adding full milk or unsweetened condensed milk (Ideal milk) with sugar of milk and cod-liver oil added. The details of the preparation of such feeds are too complicated to be given here. A doctor's advice should be taken or larger textbooks consulted. The principles of very weak feeds in small amounts are the same as in the case of breast-feeding.

GENERAL CARE AND PREVENTION OF INFECTION

The infant should be left in the cot as much as possible. Any handling is fatiguing. Exposure to lower air temperatures should be carried out slowly, and the infant should be protected from jars, loud voices and bright lights. No one with a cold or cough should come near the child. If the mother or nurse suffers in this way, a piece of gauze should be tied over the mouth and nose when attending to the baby. Pneumonia is a very common cause of the death of such infants.

Premature babies are very apt to suffer from both rickets and anæmia, but these can both be prevented by proper care and medication.

Few things are more rewarding than the saving of the life of a premature, or a delicate, underweight infant. If the mother co-operates faithfully and has intelligence it can be done. Since premature births are far from uncommon, and swell the rate of infant mortality greatly, every effort should be made to save such infants and show the mothers how they can be brought up to be healthy normal children.

CHAPTER VII

DISORDERS OF THE STOMACH AND INTESTINES

TROUBLES of the stomach and bowels affect young children much more than adults, and they always loom large at welfare centres. If statistics were taken of the complaints for which mothers seek advice, those referring to the alimentary canal would almost certainly rank highest, being only rivalled by 'colds and coughs' and 'sore eyes.' Many infant deaths, too, are returned as due to diarrhoea and 'dysentery,' and these themselves are the end results of simpler complaints. To instruct mothers how to save their children from such troubles is, therefore, a most important task. It is also not at all an easy one, as we have already seen when considering the question of the feeding of the child.

While most troubles are referable to the stomach and intestines, there are a few to be considered which occur higher up in the alimentary canal. This, it should be remembered, begins at the mouth and ends at the anus.

Inflammation of the mucous membrane, which lines the lips, cheeks, the tongue and the palate, is called *stomatitis*. The inflammation may be slight or severe. If slight it shows itself as a redness and tenderness of the gums. Such an inflammation is sometimes seen when children are 'teething,' though whether the eruption of the teeth has anything to do with it is uncertain. The gums are obviously sore and the child may refuse food. A slightly more severe form of inflammation shows itself in the form of small white spots on the inside of the lips, the cheeks, and on the tongue. When the white 'skin' comes off the spot a small ulcer is seen underneath. The spots are irritable and the glands under the chin often swell up. They quickly disappear, however.

Thrush is another form of stomatitis, which is caused by a fungus. It is most often seen in bottle-fed babies, especially those which are not well-nourished. It consists of small white patches, chiefly occurring on the inside of the cheeks

and the tongue. The white patches may be mistaken for coagulated milk, but, unlike the latter, the patches of thrush are difficult to remove, and when removed leave a bleeding surface. The fungus usually reaches the mouth through dirty teats, bottles and also from fingers. Cases of thrush occurring in young babies at welfare centres have often been caused by attempts to wash or wipe out the mouth, which is not at all necessary in healthy infants. The mother must be advised as to cleanliness of the nipples in the case of breast fed infants, and of bottles and teats in the artificially fed. She should also be instructed not to wash out the mouth, but the health visitor may apply a little boro-glycerine. The infant may refuse food on account of the pain in the mouth. Any accompanying indigestion or diarrhœa must be treated by a doctor.

Tongue-tie is a complaint that educated mothers often imagine babies to suffer from. The tongue is attached to the lower jaw by folds of mucous membrane. The central fold is called the *frænum*. The length of the *frænum* varies from one baby to another, but the cases in which abnormal shortening is found are very rare. The mother often imagines that the baby cannot suck on account of 'tongue-tie,' not taking into account the numerous other causes of lack of ability to suck. Later the mother may attribute lack of ability to talk to the same cause. While endeavouring to find out the real cause in either case, the health visitor should reassure the mother about the state of the tongue.

The *teeth* are part of the alimentary canal. But they are nourished through the blood stream, and the important part of their growth, i.e. the calcification, is completed before they appear through the gum. As we have seen, vitamin D is essential to the body to enable it to use calcium in bone formation, and the same holds good for the calcium in the teeth. Vitamin D is, therefore, needed specially for the expectant mother and the growing child. Children suffering from rickets frequently have badly formed teeth which appear irregularly. Severe illnesses in children under three years of age affect the teeth of the second dentition, as the calcifying process is going on at that age. This is one reason why small children should be protected from such illnesses. Carious or bad teeth are not often seen at welfare centres. If discovered they should be treated suitably.

Many mothers attending centres have good teeth, but suffer from pyorrhœa. The exact cause of pyorrhœa is not understood, but it may be infectious and is always unsightly and unpleasant. Mothers should be advised about the care of their own and their children's teeth.

Indigestion in infants is accompanied by three symptoms usually. These are vomiting, colic and diarrhœa. It is as well to remind the student here that vomiting, colic and diarrhœa are not diseases in themselves. They are *signs* of disease, and each may be due to a variety of causes. The cause may even lie outside the alimentary canal altogether, e.g. vomiting may be 'reflex.' While bearing this in mind, it is convenient nevertheless to consider each symptom separately.

VOMITING

Slight vomiting may occur in infants without the presence of indigestion. When the baby has taken too much, as often happens when the breasts are full and the baby hungry, the excess simply overflows without effort on the infant's part. Again the baby may drink too quickly or he may be handled too much after a meal, or he may 'bring up' wind, and with the wind some of the milk. The mother herself may have some idea, on being questioned, as to which is the cause. If not, the health visitor can often discover it if the baby is given a feed in her presence. In bottle fed babies quick feeding may be due to too large a hole in the teat. The mother should be instructed to compress the breast behind the nipple (see p. 33) to lessen the speed of the flow, and to keep the child at the breast a shorter time if he takes too much. She should support him carefully on the shoulder to help him to bring up the wind, and then put him in his cot without further handling. To test the hole in a teat, hold the bottle upside down and observe the rate of flow of the milk. It should come out one drop at a time and about one drop a second, never gush or pour out.

When the vomiting is *due to indigestion* it is the food which causes irritation to the mucous membrane of the stomach, and hence rejection of the food. It is the protein and the fat in the food which usually disagree, and the condition occurs much more frequently in bottle fed infants than in the breast fed. The child may bring up mucus as well as food if the irritation

is severe. He is restless on account of pain and fretful, and may have fever. The tongue is coated. Colic and diarrhœa often accompany the vomiting.

Every endeavour must be made to find out the cause of the vomiting, and the mother must be closely questioned about the feeding of the child, with all details as to the nature of the food, the bottle, the teats, intervals of feeding, etc. A doctor's help will probably be needed to determine the kind of food the infant should have if a change is indicated. Never encourage a change of food, however, without a really good reason for it. During the attack advise the mother to starve the child, and point out the uselessness of giving food which is only rejected and causes further irritation to the mucous membrane. To wash out the stomach give the child a warm solution of bicarbonate of soda (1 drachm to the pint). This will cause vomiting, but cleanse the stomach. The mother must be warned that the *first* effect will be more vomiting. When the vomiting has stopped, the mother should give very diluted milk at first, or preferably whey, and the health visitor should see that the doctor's directions about both food and medicine are carried out.

COLIC

Colic means griping pain of any kind, but in infants it is usually applied to pain referred to the bowel. It is really caused by spasmodic contractions of the muscle in the intestinal wall, in the effort to get rid of bowel contents which are irritating the mucous membrane. The irritating material may be undigested food, gas from fermentation or hard fæcal matter, so that colic is a usual accompaniment of indigestion, diarrhœa or constipation. If there is much gas formation, or swallowing of air through rapid feeding, the bowel may be very distended. Purgatives, by increasing peristalsis and irregular contractions of the bowel, cause colic. A chill causes inflammation and irritation of the bowel also. The child screams with pain, draws the legs up, and keeps the abdomen rigid. When severe the head may be bathed in perspiration, the hands and feet are cold, and the lips white. Convulsions may occur, which are very alarming to the mother.

In an acute attack, when the help of the health visitor may be sought, it is best to apply warmth to the abdomen by means

of a warm flannel. If convulsions threaten, i.e. if there are twitchings of the limbs and face, the baby should be put in a warm bath, and cold applied to the head. A small enema often relieves colic by enabling the infant to get rid of fæces or wind. Two or three ounces of warm saline should be inserted with a fine catheter. A teaspoonful of dill water, with two or three grains of bicarbonate of soda, has a similar effect in getting rid of wind.

If a baby is suffering constantly from colic, there is obviously something wrong with the feeding or hygiene. A doctor must be consulted. Mothers should always be discouraged from giving continual doses of dill water or 'gripe' water or 'soothing' powders.

DIARRHŒA

In textbooks diarrhœa is usually divided into simple diarrhœa and acute or infective diarrhœa. It is not always easy to distinguish the one from the other, and simple diarrhœa may quickly develop into a serious case, especially in India. Diarrhœa should never be treated lightly, and a doctor's advice should be taken early rather than late.

Simple diarrhœa has a variety of causes. They include over feeding, unsuitable feeding, 'dirty' feeding (e.g. sour milk, dirty bottles or teats), and a chill. Remember always that constipation often precedes diarrhœa, as the hard stools irritate the bowel wall. The health visitor has to find out the possible cause and see that the mother understands it, so as to prevent another attack.

The main symptom is, of course, an excessive number of motions. The character of the stools varies greatly. They may be more or less normal in character, but very liquid and frequently passed. The greater the number of stools the more liquid they are apt to be. When they are few and the fæcal matter is retained longer in the bowel, the water is absorbed to a greater extent, and the stool, therefore, more solid. They may be green, and contain lumps of 'curd' (casein) when protein is in excess. They may be slimy and contain white masses, which are often mistaken for curds, in fat indigestion.¹ Where sugar is in excess the stool is usually pale, watery, frothy and acid, there is

¹ There is, however, another variety of fat indigestion, where the stools are pale, hard and crumbly. This is due to the combination of calcium in the milk with fats, forming the so-called 'soap stool.'

much gas formation and the stool causes redness and excoriation of the buttocks. The infant is usually peevish, he may have fever and appear depressed, the abdomen may be tender and distended.

As is obvious and well-known, diarrhœa is more common among artificially fed babies than breast fed. The chances of the food not agreeing and lack of cleanliness are much greater in the former case. There is, however, a good deal of simple diarrhœa among breast fed babies attending welfare centres, which is almost entirely due to wrong habits of feeding. Such cases are invariably fed at all hours of the day and night, seldom have an empty stomach, with the inevitable consequences. The mother complains that the baby has frequent, greenish, undigested stools, and will sometimes blame the doctor or health visitor for lack of ability to cure the condition. But to make such a mother realise that the fault is her own, and that the remedy lies with her, is usually very difficult. In many cases all that is required is regulation of the feeding, with perhaps water before feeds to dilute the milk. In other cases a dose of castor oil (3 i) is first necessary to clear the bowel of undigested matter, and the omission of one or more feeds may be required. Water must be given instead, and the mother should withdraw the milk from her breasts. It may be necessary to keep the mother in the centre for a day to achieve this. Mothers are extremely unwilling to abstain from feeding their babies, and require much persuasion on the subject. They must be made to understand that the giving of food to an irritated bowel only increases the irritation and does the child no good. The bowel needs rest, just as a broken bone or a torn muscle needs rest. An occasional green stool in a properly fed breast fed infant which is gaining in weight is of little consequence.

In the case of artificially fed infants with diarrhœa, the cause must be carefully sought by an enquiry into the methods of feeding. A doctor's help will be required. But the health visitor will always be safe in giving a small dose of castor oil, in advising the omission of one or more feeds, and the gradual return, through whey or very dilute milk, to the ordinary feed. Dilute condensed milk is often useful at this stage being poor in fat and protein; lactic acid milk is also of value because the gastric function is usually upset in such cases. Bowel washes

are often very helpful and soothing. For these warm saline can be used, or, if the stools are very offensive, bicarbonate of soda solution. The same difficulties about unwillingness to stop feeding will probably be encountered, but on the whole there is less temptation to feed constantly in bottle fed infants, because of the trouble of preparing the bottle.

Acute or Infective Diarrhœa is due to specific organisms. If the bowel has been upset by a simple diarrhœa any infection has a better chance of developing. Hot weather also favours the occurrence of acute diarrhœa. Such attacks of diarrhœa are very alarming, and in small children may be quickly fatal. They are, of course, more common in artificially fed children.

There are two main types of acute diarrhœa, one in which blood and mucus is passed and which resembles dysentery. It may actually be due to dysentery. In the other the symptoms are rather those of cholera with the so-called 'rice-water' stools. In both cases the disease is infectious, and if cases occur in crèches or any situation where a number of children are found together, the sick child should be isolated and all napkins carefully disinfected.

The child is obviously very ill, he has a high temperature, sunken eyes and appears collapsed. Vomiting usually accompanies the diarrhœa. The symptoms point to a general infection or 'toxæmia.' Owing to the frequent stools there is great thirst, and the tissues are deprived of water. A doctor's advice must be got as soon as possible. In the meantime the mother should be told to give the child *no* milk, but plenty of water, albumen water, or very weak tea. The return to ordinary food must be very gradual, and skimmed milk and lactic acid milk are indicated. Warmth is necessary to prevent collapse.

After attacks of more or less acute diarrhœa a baby sometimes develops a chronic diarrhœa, with a varying number of loose undigested stools. Such a condition is very apt to lead to a condition of marasmus (see p. 72), since the mucous membrane is chronically irritated and the food is not properly absorbed. Such cases need a great deal of care, attention and intelligence, if the child is ever to return to a normal condition.

CONSTIPATION

Though not so common as diarrhœa, constipation is yet a fairly frequent complaint. Before considering any other cause,

it is necessary in India to rule out *opium* from the beginning. Direct questioning of the mother usually elicits a vigorous denial. It is better, if opium is suspected, to frame the question thus: 'Do you give opium in the morning or the evening?' or else, 'How much do you give?' (indicating the size with a tiny pellet of paper). This may catch the mother unawares and lead to discovery. The type of mother who gives opium is usually recognisable to the experienced health visitor. She is mostly poor and ignorant, and has not the character to battle with a crying child under adverse circumstances. Women who work in factories or in other occupations frequently give their babies opium, on account of their absences from home. Amongst the middle classes the fault is often that of a servant, who, in order to save herself trouble, secretly gives the child opium. Examination of the child itself may show it to be in a profound sleep from which it is roused with difficulty. Apart from the danger of overdose, the opium habit is a very bad one, leading to constipation, irregular times of feeding and sleep, and dullness of mind. Sometimes the infants who are given opium are shrunk and marasmic, but it is difficult to say that this is due to opium, since the opium may have been given to stop diarrhœa or induce sleep in an infant already sick, or the child may be chronically underfed. It is a surprising fact that one meets with 'opium babies' who are fat and healthy-looking. The explanation may be that such infants get much more sleep than many babies do in India.

Having excluded opium as a cause of constipation, we next try to discover other possible causes. One is simply bad habit and lack of training. On the whole, however, Indian mothers are careful to train their babies to a daily action of the bowels. Some infants seem naturally lazy about this function, and the mother has to take much trouble over the training. It must be remembered that babies vary as to the number of stools passed in 24 hours, and that infrequent stools are not necessarily constipation. Real constipation means hard, dry stools, which are passed with straining. When the amount of food taken is small, or the infant vomits much, the amount of fæcal matter may be so small that the stools are infrequent.

As regards the food, lack of water, fat and sugar are all causes of constipation, though excessive fat may also cause it

('soap stool'). The lack of water is a frequent cause in India, owing to the prejudice against giving young babies water. This is specially the case in hot weather, when the infant loses much water through perspiration. The remedy is obvious. Water can be given between or before feeds in breast fed babies and also in bottle fed ones, or the feeds may be diluted. In bottle fed babies the fat and sugar content of the feeds can be altered. Fat must only be added if there is definite lack of it in the feed, and then with caution. It can be given in the form of cod-liver oil, starting with small doses of ten drops twice a day. Sugar may be given as cane-sugar, or preferably malt sugar, which is laxative and easier to absorb. In bottle fed babies of five or six months Mellin's Food or Horlick's Malted Milk can be added to one bottle with very good results. Fruit juices are laxative and supply extra sugar as well.

Medicines should be given on a doctor's advice, but small doses of liquid paraffin are harmless. *Never* advise castor oil. Many babies start life all wrong as regards bowel habits owing to doses of castor oil in infancy. A case of occasional constipation in an infant may be relieved at the centre by a small saline enema.

CHAPTER VIII

DISORDERS OF NUTRITION

MARASMUS: WASTING IN INFANCY

MARASMUS is not really a disease. It is a symptom, giving rise to a condition of wasting, which may have several different causes. The chief of those are the following:

1. Insufficient food. There may be actually an insufficient supply of food or some condition which prevents the child getting the right amount of food (for example, pyloric stenosis).

2. Unsuitable food. The food may be deficient in some essential, such as protein, fat or vitamins. In famine conditions in India, or conditions which approach famine, young children may suffer in this way. Babies are partially or totally protected by breast-milk, but children over a year in age may suffer severely. This happens in great poverty which is not given the name of famine. Many families simply cannot afford the right diet for small children, and as a result more or less severe cases of marasmus occur.

3. Severe gastro-intestinal upsets may render the bowel incapable of absorbing the right food even when it is available. Both this condition and the provision of unsuitable food really amount to starvation of the child.

4. Chronic poisoning in the form of some disease, such as tuberculosis, syphilis, chronic middle ear disease.

5. Bad hygiene, overcrowding.

From the above it will be seen that cases of marasmus are less likely to occur in breast fed infants and among the middle and upper classes. The possession of means, however, does not prevent the occurrence of marasmus; especially as artificial feeding is more common in this class.

In appearance the child looks wizened, shrunken and wrinkled; there is great emaciation and feebleness. The tongue is frequently red, and there are patches of thrush in the mouth and excoriation of the buttocks. The abdomen may be distended. The character of the motions varies according to the nature of

the food given. The infant may display a good appetite, and often sucks his fingers till they are raw. In spite of this, he loses weight progressively. Infants suffering from marasmus easily fall victims to other diseases, especially those of the lungs, and infectious fevers.

The treatment is almost entirely dietetic. The child should be shown to a doctor, who can correct the previous diet and advise as to what should be given. Cases of marasmus require very careful nursing, treatment of any infection present, e.g. syphilis, and protection from other infection. If breast-milk is available it should always be given. Most cases, however, are among artificially fed children. Lactic acid milk is usually very helpful in such cases, and they do well on high caloric feeding (e.g. sweetened condensed milk). This must be begun with caution however, in case diarrhœa is set up. Such children should be given plenty of water, as they are nearly always suffering from 'dehydration' (lack of water in the tissues). If the case is taken in time the outlook is hopeful, but when the infant is in a serious condition when first seen it is not. If the mother is intelligent and keen and can devote time to the child, it can be nursed at home. The health visitor can give her much help by encouragement and advice. If possible, she can keep both mother and child in the centre during the day for a few days, to show her how to carry out the treatment. The infant should be brought to the welfare centre weekly for weighing, as this is essential in order to know if the treatment is being successful.

RICKETS

The cause of the disease known as rickets was for a long time the subject of great controversy. Some authorities claimed that the cause of rickets was improper diet, others that it was due to bad hygiene, especially lack of fresh air and sunshine, others that it was due to lack of power to absorb calcium. When vitamins began to be discovered and studied, it was suggested that rickets might be due to the absence of an 'anti-rachitic' vitamin in the diet. This has proved to be the case, and vitamin D is now called the anti-rachitic vitamin. The way in which the body gets its supply of vitamin D explains why different workers in the past were able to attribute the cause of rickets to such varying influences as lack of sunshine and diet. Vitamin D is either

taken into the body in some food which contains it, or is made in the body itself by the action of sunlight (or ultra-violet rays) on the skin. Thus it can easily be understood why some workers, by exposing children to plenty of sun, were able to cure or prevent rickets in this way without altering the diet, while others by giving a diet containing vitamin D were able to cure or prevent rickets, even when the amount of sunshine was insufficient.

We have yet to explain the position of calcium in the causation of the disease. Bone is largely made up of calcium, and in rickets calcium actually disappears from the bones, so that they become soft and bend easily, thus giving rise to deformities. When the real cause of rickets was still being sought, it was noticed that rickets could occur and calcium disappear from the bones even when there was sufficient calcium in the diet and it was given as a medicine. The explanation of this is that the calcium was not being absorbed from the intestine. What is necessary to secure the absorption of calcium from the bowel is vitamin D.

Once we are in possession of all these facts it is easy to understand the cause of rickets. It is due to an absence or deficiency of vitamin D, which may be the result of want of sunshine or improper diet. Vitamin D enables the body to absorb and make proper use of calcium. Vitamin D can now be made artificially and has been given the name of Calciferol.

It has been said that rickets is an uncommon disease in India. This is not as true as it was once thought to be. While the disease is less common in children than in Western countries, probably owing to protection by the sun and through breast-feeding, it is not really uncommon. Many mild cases are seen at welfare centres and in hospitals, and occasionally severe ones. In the West rickets is most common in large towns, where sunshine is prevented from reaching houses and people through the haze of smoke and fog with which such cities are enveloped. The rise of industrialism in India may bring about a similar result in India, especially if it is accompanied by a decline in breast-feeding.

Rickets is generally thought of as a disease of small children, but it can occur in older ones also. The occurrence of rickets (usually called 'late rickets') has been noticed among girls of ten

to fourteen years of age, and has been attributed to the fact that at this age girls go to school, and therefore spend many hours of the day in classrooms which are not reached by the sun. In addition, girls of this age, if belonging to the purdah-observing classes, begin to lead a more secluded life, and do not move about in the fresh air and sunshine as they did as small children.

The disease called osteomalacia in adults is really the same as rickets. In children the long bones are affected most, in adults the pelvis, leading to the deformity which all midwives learn to dread. The two diseases were thought of as different until the common cause of both was discovered.

In babies rickets is most commonly seen at nine to eighteen months, hence the old idea that rickety deformities were caused by too early walking. The early symptoms are restlessness and irritability of the child, flabbiness of the muscles and sweating of the head. Children who have begun to walk cease to try to do so. As these symptoms become more pronounced the symptoms which proceed from the bones make their appearance. The head is square in shape and appears large, some of the skull bones may be soft and give the feeling of cracking. The fontanelles are late in closing. The teeth are late in erupting and appear in irregular order. They are often badly formed and decay early. The ribs are enlarged at the junction of the bone and cartilage, the upper part of the chest narrow and the abdomen protruberant. This is the result of the pulling of the diaphragm and distension of the bowel. The softening of the bones of the spine may produce curvatures. The pressure of the trunk on the softened pelvis bones produces deformity in this site also, usually a compression from before backwards, which narrows the inlet to the true pelvis. The ends of the long bones of the arms and legs are enlarged and the shafts are bent. In the legs this may lead to permanent bowing or knock knee.

Rickety children are very apt to suffer from bronchitis and broncho-pneumonia, and any debilitating disease makes a child more liable to suffer from rickets; for example, congenital syphilis. Rickets by itself is not a fatal disease, but children do succumb to bronchitis and enteritis in the course of the disease. The treatment of rickets itself is not a difficult matter and the results are excellent. Even the bone changes disappear in a wonderful way if the treatment is undertaken in time. The important

thing is to place the child in proper hygienic surroundings, and see that he has the right diet. There are numerous patent preparations of vitamin D which are prescribed, Ostelin, Radiostol, Vigantol, Irradol, etc. Unfortunately, most are expensive. Pure cod-liver oil and cod-liver oil and malt are also given. Sun baths are very useful.

Best of all, of course, is to prevent the disease altogether by proper hygiene and diet. This, it must be remembered, includes the expectant and nursing mother. Always give most careful attention to babies who are being artificially fed, since these are the ones mostly likely to develop rickets.

CHAPTER IX

DISORDERS OF THE RESPIRATORY TRACT

THE diseases which affect the organs of respiration, i.e. the nose, mouth, throat, windpipe and lungs, are all diseases of which the primary cause is micro-organisms or bacteria, which invade the tissues of these parts. Without the presence of such organisms we should not have these diseases. We therefore call them the *primary* cause. These organisms are, however, usually present in the air in large numbers where human beings live, especially in large cities, and yet we do not find that all the inhabitants are suffering from such diseases. The reason for this is the effect of what are called *secondary* causes, which act in two ways: (1) they produce conditions which favour the growth of the organisms, and (2) they lower the power of resistance to the action of the organisms on the part of the tissues. It is not in our power to destroy these organisms in the way in which we can, for example, destroy those of cholera, hence our main efforts must be directed towards controlling the secondary causes. Of these the most important is connected with the nature of the air we breathe.

A good deal of emphasis has already been laid on the necessity for fresh air in the general development of babies. This must again be specially borne in mind in connection with the prevention of such troubles as colds, bronchitis, pneumonia and tuberculosis. The vital connection between the kind of air we breathe and these diseases is shown by the fact that they are common where fresh air is excluded; and that abundant supplies of pure air help both to prevent and to cure the conditions. It is to be remembered that we do not only find these diseases in large cities, where it is naturally more difficult to secure the proper amount of pure air. It is quite possible to find conditions just as unhygienic merely because the children are kept in confined quarters or sleep in unventilated rooms, even though the surroundings are perfectly suitable. Such conditions are met with under the purdah system, the children of course being forced to share the shut-in lives of their mothers. In India babies are

not shut up in a room by day, but in winter the rooms are apt to be hermetically sealed by night. Poverty encourages this practice, as when the bed coverings are few it is natural to try and exclude the cold air. Often, however, it is mere habit that causes the doors and windows to be shut and the bed coverings pulled over the head, or else it is due to the fact that both babies and adults have not been hardened to cold air from the start of life, and feel the cold more as a result.

The health visitor must never be tired of explaining the value of fresh air, and warning mothers against the danger of excluding it and the diseases which follow from doing so.

Another common cause of colds, etc., about which we hear a good deal nowadays, is adenoids. Adenoids are overgrowths of the lymphoid tissue at the back of the nose. If they grow at all large they block the passage for air at the back of the nose, and the child is forced to breathe through the mouth. Now the nose is the proper passage for the air. By passing through the nose the air is warmed, it is also purified of gross impurities, such as dust, and to some extent of micro-organisms. If the child breathes through the mouth, the cold air has direct access to the lungs, dust is not arrested, and micro-organisms have passed the first line of defence to the lungs. Adenoids are frequently accompanied by enlarged tonsils, which help to block the air-way to the lungs through the mouth. If this double barrier to the lungs exists, what will be the result? A sufficient amount of air is not supplied to the lungs, they are prevented from expanding properly, and, as a consequence, the chest is also not developed, and we get narrow chests and round shoulders. The used air has the same difficulty in escaping as the pure air has in reaching the lungs, and so the waste products tend to remain in the system. The blocking of the air passages produces deformity not only in the chest but also in the mouth and jaws. The palate becomes more arched, and the shape of the upper jaw, instead of being rounded, becomes V-shaped. The nostrils are narrowed, the lips thick, and the child has a heavy, apathetic look. He sleeps badly at night owing to breathing through the mouth, and he often suffers from ear-ache and from deafness. This is due to the fact that the growth tends to cover the Eustachian Tube, or passage between the pharynx and the ear. The tissue of the adenoids and enlarged tonsils

is diseased tissue, and micro-organisms find such tissue a very suitable breeding ground. Hence we get the chronic 'cold,' with perpetual nasal discharge, and with little encouragement these micro-organisms penetrate into the lungs and cause bronchitis and pneumonia. In addition, tubercle bacilli settle in the diseased tissue and so gain a footing in the body. (For example, the infection spreads from the tonsils to the glands in the neck, causing them to become enlarged, a very common condition among children.)

COMMON COLD

This is an inflamed condition of the mucous membrane of the nose and naso-pharynx. It is very common, and many babies and toddlers attending welfare centres seem to have chronic colds through the cold weather, or else pass from one cold to another. The immediate effects of one cold are not serious, but when they become chronic the child's vitality is seriously lowered, and the weight curve remains stationary. An unhealthy condition of the mucous membrane is created which predisposes to tuberculosis, and frequently leads to middle ear disease (see p. 97). Often also the child is left with a troublesome cough, the result of spread of infection to the trachea.

The most prominent symptom is the nasal discharge. It is very troublesome in young babies, because they cannot of their own efforts clear the passages. This makes sucking difficult, and sleep is disturbed because the child has to breathe through the mouth. There is often a rise of temperature and the child feels out of sorts for a day or two.

Colds are due to the infection of the passages with micro-organisms. This is the primary cause. Direct infection occurs from others suffering from the complaint, a cold usually passing through a whole family. The secondary causes are various. Cold air or draughts are commonly thought to be causes, but probably have little influence in themselves. Babies accustomed to sleep in cold air are actually more resistant to colds than others, provided they are warmly wrapped up. On the other hand, want of proper ventilation is a very important secondary cause. Sleeping in closed ill-ventilated rooms with other persons predisposes children to colds. Overclothing and underclothing are other causes, the former by inducing perspira-

tion and subsequent chilling of the skin and the latter by lowering the vitality and causing contraction of the skin vessels (see Chap. III, p. 16). Mothers attending welfare centres need a great deal of teaching on the subject of clothing. They seldom think of adjusting the clothing to the temperature of the air. As a result they take the baby from under a heavy *rezai* and expose it to the raw air of a winter morning, or they forget to remove the knitted jersey, which is suitable for the morning and evening cold, when the sun is warm at midday. Dust predisposes to infection also, by setting up an irritable condition of the mucous membrane. Children suffering from adenoids are liable to colds. A cold in the head is one of the first symptoms of several infectious diseases, notably influenza and measles. Lack of vitamin A in the diet is considered now to be a predisposing cause of colds, since vitamin A protects the body against infections of the mucous membrane.

During the attack the mother should be told to keep the child warm and quiet. Older children must be taught to blow the nose properly. The child should close one nostril and blow down the other, holding a handkerchief or a piece of soft paper a few inches from the nose. At the beginning of an attack drops of liquid paraffin, with menthol or thymol dissolved in it (gr. 1 to 1 oz.), or the patent preparation 'Mistol,' may help to cut it short. Argyrol drops in the eyes do the same, for they trickle down the nasal duct. When the nose is crusted boric or white precipitate ointment is useful. A course of cod-liver oil and malt is helpful when the child is recovering from the attack. Prevention of colds lies in improving the general hygiene, so as to strengthen the child's resistance. The baby should be protected from direct infection, if at all possible. Sleeping in the open air or in rooms where there is plenty of air must be encouraged. The clothing must be regulated to suit the temperature of the air. Attention should be given to the diet, which must include articles containing vitamins A and D; nose breathing must be encouraged.

BRONCHITIS

Bronchitis means an inflammation of the mucous membrane of the bronchi, and it varies in severity according as the larger or the finer bronchi are affected. In the former case the inflammation and accompanying secretion do not block up the passages

to such an extent as in the latter case. The breathing is therefore not interfered with so much.

Delicate children seem very liable to attacks of bronchitis, and a slight chill may bring one on. One attack does not protect from another, rather the reverse. It often starts with a cold or sore throat, which spreads down into the bronchi by direct infection. Enlarged tonsils and the presence of adenoids render children liable to bronchitis. It frequently accompanies attacks of influenza and measles. As in the case of colds, want of proper ventilation weakens the resistance of the child to bronchitis. Too much or too little clothing may play the same part as in colds.

The child's breathing is rapid, the pulse rate is also increased, and there is fever. Cough is present, but young babies have great difficulty in getting rid of the secretion in the bronchi by expectoration, as adults can.

A case of bronchitis should always be seen by a doctor, but in the meantime the child should be kept warmly in bed. Fresh air must not be excluded, but changes of temperature must be avoided, i.e. the room temperature must remain constantly the same.

PNEUMONIA (AND BRONCHO-PNEUMONIA)

In pneumonia the infection penetrates still further into the lung, and affects the air vesicles. The infection comes primarily from the mouth and throat. Poor hygiene helps, and the debilitating effects of other diseases, e.g. syphilis. Infection from another person suffering from the disease is not so common.

A child with pneumonia is obviously very ill. He has a high temperature, breathes quickly and with difficulty, bringing the extraordinary muscles of respiration into action. Sometimes he is blue with cyanosis, that is, the blood is not properly purified by air owing to the obstruction to its flow in the lungs. He does not cry loudly, as it is as much as he can do to inspire an ordinary amount of air.

A child with pneumonia should be treated without delay by a doctor; nursing is important, so that the child should be sent to a hospital if possible.

Bronchitis and pneumonia are very fatal diseases to young babies. It is important, therefore, that we should try to prevent their occurrence. There is no absolute means of prevention, but

fresh air, improved hygiene, and other measures as described above, will all help to make the baby resistant to attacks of bronchitis and pneumonia, and this is the best means of prevention. As both these diseases frequently follow attacks of measles and whooping-cough, it is important that these latter should receive more attention and more careful nursing than they usually do.

TUBERCULOSIS

Although tuberculosis is not a disease which attacks merely the respiratory tract, it is convenient to deal with it here. Tuberculosis is a disease caused by the *Tubercle Bacillus*, which attacks various organs and structures of the human body. It may remain latent or become a chronic disease, but may at any time assume an acute form. When it attacks the lungs it is called pulmonary tuberculosis, commonly known as consumption or phthisis; when other organs of the body are affected it is called tuberculosis of that organ, such as tuberculosis of the bones, glands, joints, meninges, intestines, etc.

In babies the tissues most frequently involved are the meninges, or membranes covering the brain and spinal cord, and glands, including those connected with the lungs and intestines. Tuberculosis is also responsible for most of the painful affections of the bones and joints in young patients. 'Caries,' abscesses, backward curvature of the spine, etc., are usually due to it. Tuberculosis of the lungs is not a disease of childhood, yet in youth and early adult life it is quite common.

The causative germ in all forms of tuberculosis is the tubercle bacillus, which gains entrance into our bodies in three ways:

1. Through the respiratory tract—by breathing air which is contaminated by the spray from coughing and sneezing of a tuberculosis patient, or from the dirt of dried tuberculous sputum.
2. Through the alimentary tract—by drinking or eating infected food. The milk may come from a tuberculous cow or it may be infected from other sources, as food is by flies, dirty fingers, coughing over it, etc.
3. Through abrasions of the skin, and wounds. This cause is responsible for a very small percentage of cases.

It is not a hereditary disease in the sense that the children of tuberculous parents are infected with the tubercle bacillus

through the placental circulation, but the children of tuberculous parents run an exceptional risk of becoming infected, owing to their close association with their infected parents. It is found that the new-born children of tuberculous parents nearly always grow up quite healthy, if they are removed to healthy homes immediately after birth.

Tuberculosis is essentially a house infection, the tubercle bacillus is known to live for three to six months in dark places and retain its power to produce the disease. The children are infected by inhaling the germs from coughing, sneezing or simply from the breath (*droplet infection*), or by kissing and fondling, or through the use of infected utensils, tumblers, spoons, etc., or through food infected by flies, through dried sputum, and so on. Heredity and tissue susceptibility do play a part, but it is a very minor part. It is the predisposing causes and the chances of repeated and massive infection from a tuberculous mother or father that account for the familial incidence of tuberculosis.

In no other disease do the predisposing causes play such an important part as in tuberculosis. The causative organism, the tubercle bacillus, does not, as a rule, succeed in producing the disease unless the vitality and general resistance of the body are lowered by any of the following causes:

1. Over-crowding.
2. Insanitary conditions.
3. Irregular and poor feeding.
4. Various debilitating diseases, e.g. whooping-cough, measles, chronic malaria, etc.
5. Repeated pregnancies.
6. Child marriage.
7. The custom of purdah.

In fact, anything that lowers the general resistance and vitality of the body.

It is of the utmost importance to diagnose the disease early, because early treatment is rewarded in most cases by arrest of the disease, and even cure.

It is impossible here to enter into any details as to the various manifestations of the disease, but whatever be the site of infection, active tuberculosis shows definite signs and symptoms which all should know. These are a characteristic temperature

(lowest in early hours of the morning and highest in the evening, the difference may be from 1 to 5 or 6 degrees), progressive loss of weight, night sweats, loss of energy and appetite. In addition to these, if the lungs are affected lung signs, e.g. cough and spitting of blood, are present; in cases of affections of bones, joints or glands, there will be inflammation of the respective part. The onset in all cases is gradual and insidious, and likely to be overlooked till the disease is well advanced.

The health visitor's duties in a home where she finds a case of tuberculosis are rather arduous. She has to be very tactful, and must win the confidence of the patient and the family. Instead of criticising defects, she should try to get them removed and pay special attention to the following:

The Home. It has already been pointed out that tuberculosis is associated with over-crowding and insanitary conditions of life, and an attempt should be made to find a residence in a healthy and sanitary locality. Those who can afford it should go and live in the country. The tuberculous patient should be given the best room in the house, the one which is moderately large, bright, well ventilated and having a cross ventilation.

Sunshine. Fresh air and sunlight are the great enemies of tubercle bacilli. As much sunlight should be admitted into the room as possible. In summer, when the sun is very strong, this may only be possible in the early hours of the day. But the bedding and other clothing should be freely exposed to the rays of the sun, which kills the tubercle bacilli in a few hours.

Destruction of Discharges. The sputum is the chief source of infection, but discharges from diseased bones, joints, glands, and other organs also contain tubercle bacilli. Soiled dressings should be burnt or sterilised. Patients must spit in cups or flasks containing carbolic acid lotion, 1 in 20. These cups or flasks should be boiled for an hour daily.

Ventilation. Children should sleep in a verandah or a porch, or in a well ventilated room where plenty of fresh air circulates.

Segregation. Quiescent tuberculosis may not become active during pregnancy, but may flare up during the lactation period. Therefore, both in the interests of the mother and the child, an attempt should be made to separate the baby from the mother as soon as possible after birth. The child should be brought up under hygienic conditions of life. When the baby is being

artificially fed care should be taken that the milk comes from a healthy cow. Children are very susceptible to tuberculosis, and should not be handled by any relation or friend who is suffering from the disease. If the child suffers from enlarged tonsils, adenoids or chronic colds, these must be carefully attended to.

The health visitor should study the causes and prevention of tuberculosis in greater detail, and some excellent literature is now available on the subject from the Indian point of view. The special needs of the tuberculous mother and infant life, and the special dangers to which they are exposed, must be borne in mind when we consider the subject from the point of view of maternity and infant welfare.

CHAPTER X

SKIN AFFECTIONS IN INFANCY

A FEW definitions will be helpful to the student.

A *weal* is a raised white spot surrounded by a faint red margin. It is due to distention of the lymphatics of the skin.

Erythema simply means redness of the skin. It can be caused by a great variety of agents, some acting from without and some through the blood circulation.

Vesicles are produced when the lymphatic spaces become filled with fluid which escapes owing to congestion of the vessels. The top layer of cells in the skin gets pushed up by the fluid and forms a vesicle. The eruption of chicken-pox is a good example.

Pustules form from vesicles when the irritant is severe enough to cause a leucocytosis, or increase in the number of white blood corpuscles, which attempt to deal with the irritant.

Scabs form when the pus escapes and dries on the surface of the skin.

Scales are characteristic of many skin diseases. They are simply dead epidermis, which is cast off.

Papules are small raised spots which are due to inflammation of the papillæ of the skin.

Dermatitis simply means inflammation of the skin.

The diagnosis of skin affection should really be made by a doctor. But the commoner troubles can usually be recognised by a health visitor. It should be remembered that in many cases a skin eruption is difficult to recognise on account of dirt, scratching and inflammation. Scabies, for example, looks entirely different on a well-cared-for infant who has acquired it accidentally, than in a neglected case in a dirty child.

The common affections seen in child welfare centres are the following:

PRICKLY HEAT

This is a common and troublesome complaint with babies in the hot weather and rains. It can be largely alleviated by proper measures.

It consists of tiny red papules or swellings, which occur

close together, and are sometimes topped by a tiny vesicle. The eruption is found on those parts of the body where there is most perspiration, i.e. the forehead, neck, back and chest. The parts affected are extremely irritable, and if the child is old enough he tries to scratch himself. In any case the itching makes him cross, out of sorts and restless.

Babies suffering from prickly heat should be clothed as lightly as possible. A muslin *kurta* is sufficient for the day-time. The cot should be placed where it can get air. Soap should not be used over the affected parts. Gram flour (*besan*) or oatmeal may be used in the bath instead of soap. Bathing with a weak carbolic lotion (strength 1 in 80) will relieve the itching. After the bath the skin should be carefully dried, and then powdered with starch and boracic powder to which a little salicylic acid may be added (1 oz. each of starch and boracic acid and 20 grs. of salicylic acid).

INTERTRIGO

This is the name given to an eruption developing between two skin surfaces which are continually in contact and become moist. It is, therefore, seen in infants in such places as the groin, the armpits, the folds of the neck, and, in boy babies, between the scrotum and the thighs. The affected parts are red and moist, and sometimes the upper layer of the skin has peeled off. It should never be found in babies who are in good condition and properly looked after. Daily bathing and careful drying after bathing are sufficient to prevent its occurrence.

ECZEMA

This is a term rather loosely given to inflammation of the skin which may have more than one cause. Owing to the delicacy of their skins, children are more liable to eczema than adults, and some children seem to be peculiarly susceptible to it. These children are often well nourished and fat, and it has been thought that overfeeding plays a part in causing the disease. External irritation plays a larger part. It most commonly begins on the cheeks, forehead and scalp, but any part of the body can be affected. It shows itself at first by a redness and roughness of the skin, and small red papules appear. The surface then begins to become moist, owing to the fact that serum is exuded. This serum dries and forms crusts on the surface. If the crusts

are removed, a moist red surface, which bleeds easily, is always seen. As there is a great deal of itching, the child tries to scratch himself, and so causes more bleeding. The constant itching causes the child to be very irritable and interferes with sleep, so that the general health suffers.

The disease is apt to be rather chronic, and the treatment has to be carried out very patiently and persistently. Numerous preparations are given for the treatment of eczema. It is best for the child to be placed under the care of a qualified doctor. The health visitor has to see that the general hygiene is good. She should also see that patent medicines are not used, as ignorant parents are so frequently led astray by deceptive advertisements.

INFLAMED OR EXCORIATED BUTTOCKS

This is due to want of proper attention to cleanliness, to napkins being dried and re-applied without washing, and to certain forms of diarrhœa (see p. 67). If the cause is want of cleanliness that can be corrected. If it is due to diarrhœa, it is difficult to stop till the diarrhœa passes off.

In dealing with this condition it is very necessary to keep the parts thoroughly dry. It is not necessary to use powder for this purpose; powder really only dries up any moisture the mother or nurse has left from insufficient use of the towel. The parts should be carefully washed with warm water, then dried carefully, and some ointment applied. Any simple ointment will do. The part may then be protected by a small piece of lint, cotton wool, or soft old linen.

ULCERS AND BOILS

Among babies who are brought to dispensaries, there are few more common complaints than ulcers or 'sores.' They are seen especially in the hot weather, and are often very chronic. The immediate cause is usually either some abrasion of the skin which has become infected, or else a boil or small abscess which has burst by itself and not healed up. The condition is of course enormously helped by bad hygiene, want of cleanliness either in the baby itself or in the surroundings, and an unhealthy condition of the infant. Boils or small abscesses sometimes occur in great numbers in babies; they do not usually form a

'core.' These crops of boils, especially when they occur in infants who are suffering from malnutrition, are difficult to check, and the child's health cannot greatly improve as long as they continue.

The great majority of such cases are seen in infants who are themselves not kept clean, and who come from homes where dirt abounds. If we could induce the mother to keep the baby clean that would be something, but it is not sufficient if the surroundings are always liable to cause fresh infection. Ointments and dressings of various kinds are not likely to be of very much avail as long as the conditions remain bad. The mother must be taught to give her baby a daily warm bath with soap and water, either at home or at the welfare centre. The baby's clothes must also be clean, and he must not be allowed to play or roll about in dirty places (see p. 19 on the playing pen). The general hygiene, if poor, must be attended to. Simple saline or boric lotion dressings are better than stronger applications. Ointments should be sterile. Children who show no improvement may be sent to a hospital. It must be admitted that at times all treatment seems to fail, and the condition spontaneously improves when the weather becomes cooler. If the parents are well-to-do the child may be sent to some hill station.

PEDICULOSIS

Infection of the scalp or other parts of the body with lice ought never to occur in babies properly looked after. Nevertheless we do see it even in quite young infants. Daily bathing ought to be sufficient to prevent its occurrence. The lice themselves are not difficult to get rid of, but sometimes the eggs or nits are rather persistent. The hair should be cut quite short. The application of kerosine oil generally kills all the nits, but it may be too irritating for the tender skin. A solution of corrosive sublimate may be used (strength 1 in 5,000), and Sassafras oil is said to be good.

SCABIES OR ITCH

The cause of this disease is a small parasite which burrows under the skin. It causes great irritation, and the child scratches the affected parts, which generally complicates the appearance of the disease. The animal causes a tiny black line

on the skin, which corresponds to its burrow. Its presence may cause a red raised spot, or a vesicle. A pustule is generally the result of secondary infection after scratching. The parts usually affected are the hands, especially between the fingers, the armpits and feet; babies are liable to be infected in other parts as well.

It is quite possible to avoid itch by perfect cleanliness, a daily warm bath with soap, clean clothes, etc. There is, however, not much use in attending only to the baby if the mother, or indeed any other member of the household, is suffering from itch. In that case the baby is constantly exposed to re-infection. If a case of itch is seen in a baby, the health visitor should try to secure that the mother, or any other infected member of the family, receives treatment as well as the baby. Thorough cleansing of the clothes and bedding is absolutely necessary, as well as local treatment of the skin.

IMPETIGO CONTAGIOSA

This is another common skin disease, especially among dirty, poorly-nourished children. It is very infectious, and hence is seen in children belonging to the same family. It consists of a varying number of vesicles, which are first of all filled with a clear fluid which then becomes yellow. After that the vesicle ruptures, and the fluid dries up, leaving a thick yellow crust, which gradually falls off. No permanent scar remains on the skin. The parts affected do not itch, and there is no redness surrounding them. The most common site is the face, especially about the chin and mouth. It may also occur on the neck and limbs.

A child suffering from impetigo should be shown to a doctor, but the mother or health visitor can in the meantime soften the crusts by applying warm olive oil.

SYPHILIS

We have already mentioned some features of this disease in young infants (see p. 72). The disease is so very common and so very far-reaching in its results, that it is necessary to lay emphasis on the symptoms so that it may be recognised. They are not confined to the skin, but it is convenient to deal with the subject here as the skin affections are very noticeable, and will help the health visitor in recognising the disease. If a health visitor sees what she thinks to be a case of syphilis in a

baby, she should take measures to have the child placed under the care of a doctor at once. She must carefully explain to the parents the serious character of the disease, and tell them of the necessity of prolonged treatment. While pointing out the serious consequences which follow from neglect to have treatment carried out, she should tell them that the child can in large measure be cured if proper care is taken.

Babies who are the victims of hereditary syphilis are usually born to all appearance healthy. The symptoms make their appearance after a few weeks of life. The first symptom to be noticed is usually a cold in the head, which is rather severe and lasts for a considerable time. There is a great deal of discharge, hence the child has difficulty in taking the breast and in breathing. The inflammation frequently spreads downwards to the larynx, so that the cry becomes hoarse. The rash comes out soon after the cold has begun. It consists of round, red spots, which are bright at first but subsequently turn a darker red, and then begin to scale. The rash then fades, but a discolouration remains on the skin for some time. It may be difficult to make out the colour in babies with very dark skins. Sometimes there are raised spots, hard to the touch. And at other times a scaly eruption takes place, especially on the palms and soles. This latter is very characteristic. The spots are most commonly met with on the face, the outer sides of the arms and legs, and the hands and feet. In addition to the rash we find what are called fissures and mucus patches. Fissures are common at the corners of the mouth. They are really ulcers, which are very persistent and do not heal. They are deep, and this is why a permanent mark is often left as a result. Mucus patches are found most commonly about the anus, vulva, scrotum and lips. They are raised and pale in colour. The nails of a syphilitic child are often inflamed, and the hair of the head and eyebrows sometimes comes out. The bones are frequently affected, with the result that the child may lose for a time the use of a limb and appear to be paralysed, though free movement was present at birth. The bones of the limbs are most affected; sometimes we see several of the fingers swollen in infants, owing to syphilis. The spleen is almost always enlarged and frequently also the liver.

The child's general health suffers while these symptoms develop. Syphilitic children are generally very fretful and sleep

badly. They lose in weight and are anæmic, and are liable to suffer from other diseases which may prove fatal, e.g. pneumonia.

It will probably not be in the power of the health visitor to do much to prevent the occurrence of syphilis. She must, however, do all she can to secure treatment for babies suffering from the disease, both for their own sake and for the sake of those who come into contact with them. A syphilitic child must, of course, never be suckled by a healthy woman. But a syphilitic mother should certainly nurse her baby, as the latter will stand a much better chance of fighting the disease if breast fed.

Health visitors must do all in their power to secure that a syphilitic child is placed under reliable medical treatment, and not left to the advice of quacks and patent medicine vendors. The treatment has often to be very prolonged. If a syphilitic mother is treated during pregnancy the child may be born quite healthy and free from the disease.

URTICARIA

This is an inflammation of the skin due to some constituent in the food or to a local irritation, as, for example, some plants or insects. It consists in weals, which develop suddenly and appear in crops. They generally disappear quickly with the aid of a simple purgative.

HERPES

This is an eruption of one or more vesicles, usually about the lips or nose, and often associated with a cold or with pneumonia. It is very painful at the beginning, and when the vesicle has burst and a scab forms, the child is very apt to pick the scab so that it does not heal.

VACCINATION ERUPTIONS

There are no real vaccination eruptions, that is to say, vaccination, properly carried out and properly cared for, will not cause any further skin trouble. If the vaccination is carried out carelessly, and if the site of the vaccination is not kept clean, it may become septic subsequently. If the child is at the same time suffering from a skin disease, re-inoculation on the site of the disease is possible.

Vaccinations are best left open and kept dry with dusting powder. Children must be kept from scratching the part.

CHAPTER XI

THE PREVENTION OF EYE AND EAR DISEASE

1. THE EYES

THE amount of preventable eye disease in a country like India is enormous. In tropical or semi-tropical countries certain eye diseases are more prevalent than in countries with more equable climates. The high temperatures, the glare of the sun, the dust-laden hot winds, and the low standards of hygiene favour the development of these diseases. The eyes, therefore, need special care. Instruction of mothers in this branch of mothercraft, so as to protect children, is very necessary, and it is also very rewarding. In the hot weather and rains dispensaries are crowded with cases of 'sore eyes'; most of these are entirely preventable in the home. Yet through ignorance and carelessness they are not prevented. The result is frequently the loss of sight in one or both eyes. In other cases a permanent defect is left in the eye, and the treatment is always long and painful. If mothers could be made to realise that in eye treatment, above all others, a 'stitch in time saves nine,' they would save themselves many weary visits to dispensaries for which they can ill-afford to spare time. The saving in medicines and doctors' time would also be considerable. Above all, the precious boon of sight would not be risked and the numbers of blind persons who are incapable of earning their own livelihood would be immensely reduced.

The activities of a child welfare centre offer a great opportunity for preventive teaching with regard to eye disease. Both mothers and children are seen frequently at the centre, and visited in the homes as well. This affords the worker the chance to give the lesson repeatedly to the mother, and enables her to deal with a slight case before it becomes a severe infection. Actual demonstration to the mother of how to clean the eye properly is of greater value than mere words. With intelligent and careful mothers the health visitor may allow her to wash the eyes herself, so as to enable her to do so at home. The greatest care must be taken to see that the mother understands how to

carry out the treatment and the reason for each step, e.g. clean hands, clean rags or cotton wool, gentleness, preparation of the lotion, etc.

Preventive teaching, however, must not begin when there is a case of actual 'sore eyes,' however trifling. It must aim at total prevention. Of course this is an even harder task, especially since prevention of eye disease is so largely bound up with general hygiene, so that the direct bearing of the teaching on the eye is not easily perceived by uneducated people. Health visitors can think out for themselves the most suitable form of teaching, and popular literature can be obtained on the subject. The chief points to be remembered are as follows:

Most eye disease is caused by definite organisms. The exceptions are cataract, which is very exceptional in children, keratomalacia, which is a deficiency disease, and accidents. Micro-organisms reach the eye in various ways, such as the following: Dust and dirt, dirty fingers, towels, *chaddars* or *saris*, the use of a *surmuchu*, flies (especially in babies), from other members of the family, or from playmates. Stress the fact to the mother that the conjunctiva is a very thin delicate membrane, easily injured, and that a very slight injury makes a splendid place for any germs to settle in. Then show them in more detail how the organisms reach the eye. Dust blows about at certain times of the year in great quantities. Its gritty particles injure the conjunctiva and it carries germs with it. Bathing the eyes with normal saline or boric lotion will help to prevent infection. Always prevent children rubbing the eyes with the hands, and keep the hands as clean as possible in case they do it when your back is turned! Never use a dirty towel to wipe the eyes, and *never* a *chaddar* or *sari*. (The commonest thing in the world is to see a mother wipe a baby's or child's eye with her *chaddar* or *sari*, often none too clean; she frequently uses her own hands, too.) Blackening the lids with *surma* or *kajal* is usually done with a rod (*surmuchu*) which is common to the whole family. The *surma* itself may irritate the eyes, though, on account of its astringent nature, it is often considered helpful in sore eyes. The danger of flies in eye disease requires lengthy and frequent explanation. This lesson may also be brought into a lesson on flies themselves. Grown-up people keep flies away from their eyes usually unless sick, but babies and small children

helplessly allow the flies to crawl about their faces. Flies and sore eyes go together. This may be due to the fact that the atmospheric conditions favour both, but there are also innumerable cases of direct infection by flies. Watch two babies. One has sore eyes; the other has not, but most likely has a dirty face. Since flies like dirt they light on the faces of both babies, and take the infection from one to the other. Keeping the baby clean will lessen the attraction of flies, but, better still, protect the sleeping infant with a net. Best of all, prevent the breeding of flies! This latter is very difficult. The willingness of one individual to stop breeding places is defeated by the carelessness and apathy of neighbours, who leave scraps about, defecate in open spaces, and make no attempt to keep their immediate surroundings hygienic. Such conduct discourages those who would like to have a better state of affairs. The problem is really one for the whole community to attack.

If a mother or 'big sister' is suffering from eye disease, treatment must be secured for her. It is of no use to try and get the baby's eyes right if there is a source of infection continually present only one foot away. Though welfare centres are only supposed to cater for children and antenatal cases, this is a case in which treatment of the mother is necessary in the child's interest.

A brief explanation of the most common forms of eye infection will be helpful to the health visitor.

Conjunctivitis simply means inflammation of the conjunctiva. It may be a mild redness and watering of the eyes, or it may be a violent inflammation with profuse secretion of pus, and such swelling of the lids that the eyes cannot be opened. The great danger in acute inflammation is that the infection may spread to the cornea. This produces a corneal ulcer, which, if slight, leaves a white mark (or opacity) on the eye after healing, and which, if severe, may lead to disintegration of the whole eye.

As every midwife knows, conjunctivitis in newly-born babies is very dangerous. It is most frequently due to infection by the gonococcus, caused during the baby's birth through the presence of the germs in the vaginal secretion of the mother.

Blepharitis means inflammation of the lids of the eye. It often occurs after measles. *Styes* are small abscesses of the glands in the margin of the lid.

Trachoma or '*Granular Lids*,' is a very common disease in India. It is difficult to treat and very chronic. It usually attacks the conjunctiva of the upper lids, and on turning up the lid the characteristic granules can be seen. The lids look heavy. The deeper structures are also involved. The granules rub against the cornea and inflame it. When healing takes place scar tissue forms, and the inner side of the lid contracts. This brings the lashes in contact with the eyeball, resulting in constant irritation. This condition is not seen in young children since it is an advanced stage of the disease. It is, however, often seen in mothers, and, since the irritation of the lashes produces a chronic conjunctivitis, such mothers invariably infect their babies. *Trachoma* is very infectious.

Keratomalacia is really a 'deficiency' disease due to the absence of vitamin A in the diet. The white of the eye becomes dark in colour, dry and greasy looking. The affection spreads to the cornea, which becomes opaque and yellow. After that the cornea often ulcerates and the sight may be lost.

Smallpox frequently affects the eyes, and may lead to blindness in one or both.

Squint in young children means a defect in vision which should be corrected by glasses. If this is not done, the squint continues and the sight of one eye may be lost. If glasses are worn the defect is corrected, and the child can usually leave off the glasses at about 16 years of age. Any middle-class mother whose child squints should be strongly advised to have him seen by an eye specialist. In small girls it may be pointed out that the future chances as regards marriage may be adversely affected by a squint! In the case of boys admission to services has to be considered.

Accidents may cause injury to the eye. Children should be taught to remember such dangers in their play. Fireworks should not be given to children.

2. THE EARS

Ear discharge is fairly common among young children. It is apt to be rather chronic and does not receive the attention it should. The mothers get tired of attending the dispensary, and they do not realise the consequences of neglecting to have treatment properly carried out.

The discharge occasionally comes from the outer part of the ear, as in the case of eczema of that part or a small boil. More usually, however, the discharge comes from the middle ear, or that part of the ear which lies beyond the ear-drum. The discharge, in order to escape, bursts its way through the ear-drum. If the condition remains untreated it can be easily seen that the hole in the ear-drum tends to get larger with the constant discharge. As a result the hole cannot heal up even when the discharge has stopped, but remains permanently. The hearing of the child is therefore interfered with.

How is it that the discharge, resulting of course from inflammation, comes from the middle ear? In the great majority of cases the infection comes primarily from the nose or pharynx, by way of the Eustachian tube, or passage leading from the pharynx to the ear. As the mucous membrane of the pharynx is continuous with that which lines the middle ear, any inflammation in the pharynx has an easy passage to the middle ear. As the space there is very small and the Eustachian tube becomes easily blocked, the discharge finds its way out through the external ear by pushing its way out through the ear-drum. Discharge from the ear, therefore, follows any condition where there is inflammation of the nose and throat, e.g. an ordinary cold, influenza, measles, enlarged tonsils and adenoids.

In order to prevent the occurrence of discharge from the ears, we must keep the nose and throat in as healthy a condition as possible. The importance of this has been already dwelt upon. Discharging ears are apt to be neglected in the same way as sore eyes. Mothers must be warned of the dangers of doing so. The commonest consequence of neglect is deafness, but in addition it may be followed by inflammation of the surrounding bones, inflammation of the coverings of the brain, abscess of the brain, and facial paralysis. Even a slight watery discharge should be carefully watched, and the baby shown to a doctor. This is especially the case if the baby is running a temperature for no other obvious reason, and if he is fretful and wakeful. Health visitors should discourage home treatment by syringing or other means, as more likely to do harm than good.

So long as there is a visiting doctor who can examine and prescribe at a child welfare centre, the treatment of the simpler eye and ear troubles can be satisfactorily carried out at the

centre. In an ordinary dispensary the numbers are usually too great to allow of sufficient time being given to do the treatment adequately. The health visitor should follow out the doctor's orders between her visits.

CHAPTER XII

ABNORMALITIES

THERE are a few abnormalities, occasionally present at birth, which are mentioned in this book so that the health visitor may know what action she should take to secure treatment for them and how she can help the child or the mother. In some cases treatment is needed at once, in others it has to be continued for a long time. In both circumstances the health visitor can be of the greatest help, first because she frequently sees the infant early in life before the parents have thought of medical aid, and second because she is in constant touch with the family and can see that the treatment is persisted in.

HARE-LIP AND CLEFT PALATE

In the condition known as 'hare-lip' there is a division in the upper lip, so that the lip is in two halves. The defect may be in the middle line or at one side. An operation should be performed early in the child's life. The reasons for the operation are more æsthetic than medical, since the condition is not dangerous to life though sucking may be difficult at first. It should be impressed on the parents that the result as regards appearance will be much better if the operation is done early, and in the hands of a good surgeon there is little danger. The health visitor should help the parents to make the necessary arrangements.

Cleft palate is a much more serious condition. In this there is a gap in the palate, which may involve the soft palate only or the bony palate only, or both. The lack of palate interferes with chewing, swallowing and speech. The feeding of such children is very difficult. Spoon feeding is necessary, but this does not mean that breast-milk is not to be used. It can be withdrawn and given to the child with a special spoon. Such babies should be placed under expert advice at once. The doctor will advise as to whether an operation is immediately required or at a later stage.

CLUB-FOOT

This means that the infant is born with one or both feet abnormally placed with regard to the leg. The foot may be found in various positions, either turned in or turned out, and with the ankle joint either unduly flexed or extended.

In severe cases surgical interference may be necessary, though not always immediately after birth. In mild cases, massage and moving of the foot into the correct position may suffice. This is where the health visitor can be of great help. She should arrange for the infant to be seen by a competent doctor, and should understand fully the advice given and the manipulations the mother is asked to carry out. She must then see that the mother understands how to perform the manipulations required and carries them out faithfully. She must make the mother understand the importance of such treatment to the child in later life. Once a week the movements can be performed in the presence of the health visitor, in order that she may be satisfied that they are being carried out correctly. She should also arrange for periodic visits to the doctor, and operations if they are considered necessary.

HERNIA

The common type of hernia seen at child welfare centres is the umbilical hernia, where the bowel protrudes through a gap in the abdominal wall under the skin. The condition usually develops after birth, and is often due to pulling on the cord or septic navel, the result of bad midwifery. Mild cases are seen frequently and many of them seem to disappear spontaneously. In bad cases the opening gets larger, the skin yields more and more, and when the child cries, or strains, a large protrusion is visible. The old-fashioned method, of a coin wrapped in a piece of cloth and placed over the umbilicus, is seldom effectual, as it does not stay in place. A better method is to push back the bowel through the opening and then cause the muscles to meet in the middle line, keeping them in position with straps of adhesive plaster. These can be renewed as often as necessary at the welfare centre.

Another form of hernia is inguinal hernia, where a loop of bowel may be found in the inguinal canal (the passage in the

groin containing the spermatic cord). This should always be shown to a doctor if discovered.

NÆVUS

A nævus, or 'birth-mark,' consists of a mass of dilated capillaries under the skin. It is bright red or purple in colour, of varying size, and may project beyond the surface of the skin. When large and protuberant it may bleed or ulcerate when injured, and if occurring on the face or neck is disfiguring. Treatment should be arranged for in a hospital.

CONGENITAL PYLORIC STENOSIS

This is a rare condition, in which there is overgrowth and spasm of the circular muscle at the pylorus, or lower end of the stomach. The passage of the food into the bowel is therefore obstructed and vomiting results. The vomiting is forcible in character. The stomach becomes dilated, and the milk of two or three feeds may be retained and then rejected. The muscle of the stomach wall becomes hypertrophied and the attempts to force the stomach contents through the pylorus can be seen under the skin. The child's weight decreases and he suffers from constipation. Very often the vomiting causes the parents to think that the food is not agreeing with the child, and so a change of food is tried, without effect.

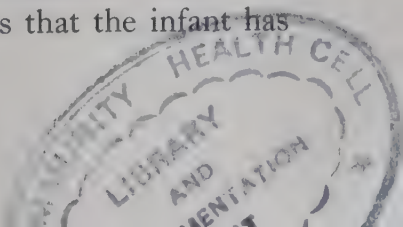
The condition usually develops within a week or two of birth. If a case of persistent vomiting is discovered with symptoms as described above, the health visitor should lose no time in getting the child shown to a doctor. She should especially prevent the parents from altering the feeding and spending their money on useless remedies.

IMPERFORATE ANUS

This is a rare, but serious, condition. It means that the infant is born without a proper opening of the lower bowel. Sometimes there is a dimple in the skin in the place of the opening. If the infant has been carefully bathed the condition may be noticed soon after birth (of course, if meconium is passed at, or soon after birth, the question does not arise). If not noticed at once, the mother soon observes that the infant has

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no bowel movements. The health visitor should secure treatment with the least possible delay, explaining to the parents the danger of the condition.

CHAPTER XIII

GENERAL DEVELOPMENT OF THE TODDLER

AFTER twelve months, the baby is considered to be no longer an infant. The age between infancy and school age is variously called the 'pre-school' age or the 'toddler' age. Though the expression, 'toddler,' is not altogether ideal, it is the only convenient term yet suggested to describe children at this period. The distinction between the infant and the toddler is a purely arbitrary one, but it is a matter of convenience to divide the child's life into these two portions, partly because by the age of one year the child has made, or is making, three important advances: (1) he is abandoning his infant diet of pure milk, (2) he is learning to walk, i.e. gaining the means of independent locomotion, (3) he is learning to talk, i.e. gaining the means of expressing his will and his feelings in the language of other human beings. The other reason for the division is that the death-rate of children under the age of one year is reckoned separately from the general death-rate as 'infant mortality.' After the age of five the child should no longer attend the child welfare centre. This again is arbitrary, but there are reasons for it. In the first place, space and funds usually forbid a centre to care for its toddlers for a longer period than this. The younger the child the more care does it need, and the more important is it to educate the mother. Hence we must let the older child give way to the baby. Secondly, at this age the child should go to school. The time is rapidly coming when school will be compulsory for him—and for *her* too! As yet there is no general provision for the schools to take over the health care of their pupils. But that also is bound to come.

In caring for the child from one to five we perform a very important task. The toddler presents us with different problems to those of the infant. The infant has a simple diet, a restricted field of activity, is not so exposed to or so liable to infection, and is more under the care of the mother. At the toddler age the child's diet is increased, his activities are much more numerous, he is more exposed to infection, and he is more independent of

his mother, and therefore not so much under her continual care. Not only this, but the mental and moral development of the toddler becomes increasingly complex, and this presents problems to the mother which are just as difficult to solve as those affecting his bodily growth.

THE PHYSICAL DEVELOPMENT OF THE TODDLER

Weight

At the end of the second year the child should weigh 28 lbs.

"	"	"	"	"	third	"	"	"	"	"	32 $\frac{1}{2}$	"
"	"	"	"	"	fourth	"	"	"	"	"	36	"
"	"	"	"	"	fifth	"	"	"	"	"	40 $\frac{1}{2}$	"
"	"	"	"	"	sixth	"	"	"	"	"	44	"

These are only averages; moreover they are the weight of English children, and Indian children will probably be somewhat lighter. A good deal depends on the race the child belongs to, even when properly fed: thus a Madrassi or Bengali child will be lighter than a Punjabi or Pathan child. Boys usually weigh rather more than girls. The important thing is that the child should *gain* in weight. What we frequently find among toddlers attending clinics, is children of two years who weigh less than 20 lbs. and children of three who are less than 25 lbs. If we find such cases, there must be something wrong either in the child's past or in his present. If the fault lies in the past, we can soon find that out by regular weighings. Weigh the child every fortnight for two or three months. If he gains we may conclude the fault is in the past, and the child is now gaining satisfactorily. If we find that the child has not gained over two or three months we know that something is wrong in the present. Usually the lack of gain is due to improper feeding or lack of sleep, or both.

Height

At the end of the second year the child's height should be 33 ins.

"	"	"	"	"	third	"	"	"	"	"	35	"
"	"	"	"	"	fourth	"	"	"	"	"	38 $\frac{1}{2}$	"
"	"	"	"	"	fifth	"	"	"	"	"	41 $\frac{1}{2}$	"
"	"	"	"	"	sixth	"	"	"	"	"	43 $\frac{1}{2}$	"

There are no statistics to show whether these heights,

which are of Western children, are correct for Indian children. Increase in height is not so important as increase in weight, but the child should not, at any rate, stand still in this respect. The ratio, or relation, between the child's weight and height is important. A child may be too tall for his weight, or he may weigh too much for his height. The proper ratio between weight and height is really more important than the weight for age.

The growth of the head is very rapid during the first year of life, then the increase is more gradual up to the fifth year, after which the head grows very little. The growth of the brain corresponds.

In infants the chest is small compared to the abdomen; after two years the chest is larger in circumference than the abdomen. The lower abdomen is protuberant in early childhood, but becomes less so later on.

The pulse varies from 105 to 90 from two to six years. Its variations are greater than in an adult. The same is the case with the rate of respiration.

Teeth

At the age of one year, the average number of teeth is six, namely, two lower central incisors, two upper central incisors, and two upper lateral incisors. The next six teeth often come together, namely, the lower lateral incisors and the four anterior molars. These are usually cut by the 15th month. After that the child usually has a rest till the canines appear at the age of 18 to 22 months. When the canines have been cut another pause generally occurs before the posterior molars are cut at 24 to 30 months. The toddler retains these 20 teeth until the first permanent molars are cut at six years, at which time also he loses his first teeth, namely, the lower central incisors.

The state of the teeth is frequently a help in deciding a child's age. Sometimes a mother, for reasons of her own, tries to make the child out younger than he really is. If a mother states the child's age as two years and we find he has a complete set of teeth, then we may suspect that she is not telling the truth.

The condition of the teeth depends on the state of nutrition of the child to some extent. Irregular, badly formed, decaying teeth are signs of ill-health or past illness. Decay of the milk

teeth should not occur in healthy children. Decayed teeth, if found, should be stopped or extracted.

Walking

The first attempts at walking are made at 12 to 15 months on the average, but there is wide variation above and below this average. A healthy child should walk alone not later than two years. The child, if left to himself, undertakes what he is fitted for. A play-pen is a great help. The child can pull himself up in the play-pen, learns to walk by holding on to it, and his toys do not roll too far out of reach. The spoilt child will not be content to be by himself in the play-pen, but for a child of good habits it is admirable. While a child should not be forced to walk, he should also not be discouraged. The legs of many infants are bowed until they are nearly two; the use of the muscles involved in walking straightens the legs; yet we often hear people say that such children should be 'kept off their legs.'

In rickety children, with deformity of the legs, the child ceases to walk of his own accord, and the bowing occurs as a result of the posture he adopts in sitting. Some mothers carry their children long after it is necessary, which is bad for both the mother and child. Always encourage the toddler to walk at the centre. Apart from the physical benefit, it encourages independence on the part of the child. During the third year the movements of the child become more complicated; he learns to run, to skip, hop, jump, etc. All these movements mean fresh co-ordination of the muscles and more control. The eye learns to act along with the hands and legs, especially when ball games begin to be played.

MENTAL DEVELOPMENT

Under this heading we must include not only the growth of the mind, meaning the 'thinking' apparatus, but also advancement along moral, emotional and social lines. Of course, it is impossible to separate the child's mind up into such divisions, they all dovetail into one another.

A child is usually using single words by the end of the first year. These refer to familiar objects or persons, e.g. father, mother, milk, food, etc. Next come simple verbs denoting frequent actions, e.g. go, come, make, play, etc. After that adjectives and adverbs are used. By the end of the second year

the child can usually make short sentences. If a child of two years makes no attempt at speaking, suspicion should be aroused that he is either mentally defective or a deaf mute. In the latter case the inability to speak is due to the fact that sounds are not heard. Such children can be taught to speak by special methods. In rare cases children do not talk for reasons which appear to be purely psychological, they are usually children who are very precious, or spoilt, or only children. Some parents make the mistake of talking baby language to their children, i.e. they pronounce words as a baby tends to do. This is a very foolish habit. If words are always spoken to the child with correct pronunciation he will learn to say them correctly, though, of course, some children find it easier to do this than others.

During the third year the child learns to talk connectedly, uses pronouns, and in the fourth year can express himself well. At this time a child can speak more than one language and keep the two quite separate. He constantly adds to his vocabulary.

CHAPTER XIV

GENERAL CARE OF THE TODDLER

CLOTHING

THE objects of clothing are usually stated to be (1) to maintain the body heat, (2) for decency, and (3) for adornment. The last two named do not concern us much in the case of toddlers. If they do, it is generally at the expense of the child's comfort or convenience. In a warm climate, where there is little variation in temperature, clothes are unnecessary for toddlers. When the air temperature approximates to the body temperature, the body ceases to lose heat. The greater the difference of temperature between the body and the surrounding air, the more heat is lost and the more the need for clothing arises. After the age of four the child may demand a garment because he sees that adults clothe themselves. It should never be suggested to the child that it is wrong or shameful to be unclothed. Gradually he will accept the fact that some clothing is a convention of society.

While clothing should be neat and attractive it should be comfortable and convenient, allow the child to exercise his limbs freely, and be washable. Among the better classes children are sometimes dressed, to satisfy the mother's vanity, in unsuitable materials, and then scolded because they soil or tear the garments. Could anything be more unjust? Simple patterns and washable materials, without trimmings, should be the rule. Simplicity of pattern should mean, among other things, that the garment is easily put on and off *by the child himself*. Children should always be encouraged to dress and undress themselves, they delight in doing so. Only too often the mother insists in putting on the child's clothes. Often she gives as the reason that the child takes too long. This may be true at first, but to let the child dress himself saves time in the long run, besides being much better for the child! If he is not allowed to try and fasten buttons and tapes at two or three, he gives up the attempt, and the result is we see children of four, five or six, standing like posts, letting a mother or a servant dress them.

Clothing must be suitable to the season and to the time of day. The uneducated mother finds the latter point very hard to grasp. She fails to realise that what is required at 6 a.m. is not necessary at noon, and yet may be required at 6 p.m. The same mother will let a child crawl out of a warm bed into cold air without realising the danger. This is a frequent cause of colds and coughs, especially when the room is at the same time shut up to prevent access of fresh air. Mothers also need much teaching on the parts of the body which it is essential to protect from cold. A cool head and warm feet is the ideal, but the very opposite seems to be aimed at by many mothers, who bring their children naked from the hips downwards, but with heads enveloped in thick woollen or quilted bonnets. The reason often given for the absence of clothing on the lower part of the body is that the mother is afraid the garments will get wet or soiled. With a child over 18 months this should never happen in the day, and often children are perfectly clean from twelve months if they have been properly trained. In any case the remedy is to train the child, not to deprive him of garments! Moreover, a child warmly clad over the buttocks and legs wets much less frequently than if the parts are exposed. Absence of covering here usually means that the abdomen is uncovered as well, and this leads to chills. These remarks apply to children under two. But even when the child runs about himself, and wears pyjamas or knickers, the fault is usually to overclothe the upper part of the body and underclothe the lower.

Bearing the above rules in mind, what garments should be adopted for a toddler? Of course, we have to consider the parents' social position and means. Assuming that the parents have sufficient to clothe the child, the toddler in the second and third year should have for the winter months a warm vest and warm knickers or pyjamas to cover the buttocks and thighs. The usual style is to have the pyjamas on a cord, but a small child finds it difficult to keep these up, and, besides, a gap is frequently left between vest and pyjamas in such a case. It is better to have a bodice on which the knickers or pyjamas can be fastened. If the vest is flannel (that is, not knitted) buttons can be put on to it direct.

Warm woven material, such as is made at the Cawnpore mills, is very suitable for those garments. Over this the child

should have another garment of cotton material, either a *kurta* and 'pyjama' or a 'romper.' The cotton upper garment keeps the under one clean and is more easily washed, and can therefore be changed oftener. Socks for the feet and legs are required, and they should be long enough to come above the calf. For morning and evening a knitted or woven jersey is required. These are much better for children than coats made of cloth, as they allow greater freedom of movement while fitting more snugly.

When walking begins shoes or sandals have to be worn in winter. They should be very broad and have low flat heels or none at all. Children should not be allowed to tread down the heels of their shoes, and if a shoe gets out of shape it should be discarded at once. Rubber soled shoes with straps are very suitable for small children, and they have the advantage of being noiseless. Boots are quite unnecessary. They are hot, heavy and ugly. If the ankles are 'weak' the muscles should be strengthened, rather than boots adopted. For slightly older children, *kurtas* and pyjamas can be worn, *saris* are difficult for small girls, but where pyjamas are not worn bodices and skirts may take their place, or else frocks of a simple pattern. Simple pinafores protect the clothes while playing or at meal times. A pocket should be provided in every garment, but the child must be taught that the pocket is meant to hold a handkerchief, not a collection of stones, monkey-nuts or other treasures.

Caps may be needed in the morning or evening, in very cold weather, but if the rest of the body is warm they are not usually required.

In warm weather and warm climates garments should be reduced to a minimum. Sandals should be worn on the street, as children get septic places in their feet so easily, which are troublesome to heal, and also, in certain localities, on account of hookworm infection. At bedtime all garments should be removed. Small children can wear simple night dresses, and older ones *kurtas* and pyjamas. The day clothes, especially under garments, should be aired if the child has run about much and perspired.

The following are common faults which should be avoided in children's clothes:

1. Too many clothes (among the well-to-do), they prevent the child moving freely and impede the circulation.
2. Unsuitable materials, e.g. thick cloth, velvet or velveteen,

brocaded silk. They are not washable, not comfortable, and look bad when soiled.

3. Padded coats and caps. They are much used by the poorer classes in North India because they are warm and cheap. But they are difficult to wash, and therefore usually not washed, do not allow of the access of air, impede movements and harbour insects.

SLEEP

Sleep is necessary for physical and mental rest. The vital processes are all slowed down during sleep; not only are the voluntary muscles inactive, but the rate of the heart beat and of respiration is slower. This repose is specially necessary in the young, when growth is proceeding rapidly and the child takes a lot of exercise both of body and mind.

A child of 1—2 years needs 13 hours' sleep							
„	„	„	2—4	„	„	12	„
„	„	„	4—6	„	„	11	„

Individual children vary slightly in the amount required. This amount should be spread over two periods, 10 to 12 hours at night and 1 to 2 hours during the day. The day-time rest should not be given up till the child is about seven, even if the child does not actually sleep in the day, when 6 to 7 he should lie down and rest. He may have a book to amuse him, but not toys, and usually he will sleep part of that time.

Many children in India suffer from too little sleep. Even in well-to-do families there is no regular time for going to bed, the child goes to bed when he likes; in fact, he seldom goes to bed, but merely falls asleep where he happens to be from sheer fatigue. He is then lifted up and laid in bed, without being undressed or bathed. Going to bed late does not necessarily mean that the child sleeps late in the morning. The habit of putting the child to bed at regular hours must be begun in babyhood, or else it is not likely to be formed at all. Once formed, it is comparatively easy to continue. As in so many other things, if the habit is formed while the child is unconscious he accepts it without question when older. It is a part of his life. The same is true with the midday rest. If it is part of a regular routine, it is accepted as such and there is seldom trouble in getting it carried out.

The hour or half hour before going to bed at night should be spent in some quiet occupation, looking at pictures or hearing stories, or some quiet game. An exciting game may cause the child to object to going to bed, and prevent sleep coming easily.

Every child should have his own bed. There is no real difficulty for the well-to-do to provide a bed for each child and the necessary space for the bed. The poor may not find this easy, but only too often in well-to-do houses we find young children sharing a bed with an elder. The reason frequently given is that the child will be afraid if alone, or, in winter, that he will be cold. In fact, the mother of a baby of four weeks, when reproached because a separate bed had not been provided for the baby, asserted that he would be afraid. Of course, even at this age, the baby prefers the mother's arms, but he cannot be said to be *afraid* alone. This only brings us back to our same lesson, namely, that the foundations of all habits must be laid in infancy. If as an infant the baby is accustomed to sleep alone, and this rule is strictly adhered to, he will not feel afraid in his own bed. The children should, if at all possible, have their own sleeping room, and in any case the child's bed should not be close up to the mother's. There are several reasons for this. First, he gets fresher air to breathe; second, there is no risk of his seeing and hearing things unsuited to his age; third, it trains him in independence of character. The mother, of course, feels tempted to have the child near her in order that she may easily look at him in the night without rising herself, but in saving herself this trouble she is sacrificing a benefit to her child.

Another sleep habit which should be formed early is that of going to sleep in the dark. This, too, if begun in infancy will be easy to continue. Sometimes bad suggestions make a child afraid of the dark who was formerly fearless. That can usually be got over with patience and wise handling, but a child who has always been accustomed to go to sleep with the light on will find it hard to leave off the habit.

Children should go to sleep by themselves, and should not be patted, rocked or sung to sleep. They should be accustomed to go to sleep in the presence of moderate noise, and not be easily wakened by noise.

Disturbed sleep is bad; it shortens the actual time of sleep and makes it less profound and refreshing. Some of the causes are:

1. Bad ventilation—closed windows, etc. Fresh air means sound and refreshing sleep.
2. Enlarged tonsils or adenoids, colds in the head, which interfere with breathing.
3. External irritation; an uncomfortable bed, too much bedding; fleas, bugs or mosquitoes; much noise or light, sleeping with others.
4. Hunger or thirst.
5. 'Nerves'; over fatigue, or excitement, causing it difficult for the child to relax; fear.

CLEANLINESS

What has been said about the infant's bath (see Chap. III) applies also to the toddler. The toddler also needs a daily bath because he runs about and gets dirty during his play and exercise makes him perspire. The time when the bath is given does not matter much, but before going to bed at night is a good time, or before the midday sleep. Warm water is necessary in winter, and takes the dirt off more easily. A cold douche may be given after a warm bath, but care should be taken that the child reacts properly. Plenty of soap should be used. Tubs are not necessary. The Indian method of bathing is much cleaner than the Western—that is the 'pour' bath. The child should be encouraged to bath himself, though of course the mother must supervise and see that all the corners are clean. The hair should be washed once a week, and a very little oil rubbed into it. Mothers are apt to use too much oil. Brushing brings out the natural oil in the scalp, and is a preferable method of oiling the hair. Each child should have his own towel, brush and comb, and be trained to use his own and no other. Hands should always be washed before and after each meal, and care should be taken that they are really clean; the mere ceremonial pouring of water over the hands is not sufficient.

The care of the teeth should be begun at an early age. The child should be taught to rinse out the mouth after each meal. The child may have a tooth brush, if the parents can afford to renew it frequently enough. He may also be taught to rub the teeth with the fingers, or, later on, to use a 'tooth stick.' But the rinsing of the mouth is the most important thing to learn.

Nails should be kept short and clean.

EXERCISE AND PLAY

As soon as a child learns to walk he is constantly on the move if in good health. The child of two to five, who sits still and makes no effort to exercise or amuse himself, is either in bad health or a mental defective. The normal child exercises himself if he has sufficient space to do so, and he usually regulates the amount by instinct. When he is tired he stops of his own accord. Small children prefer standing and walking or running to sitting. Ideally every child should have the opportunity to play in an open space—preferably one where there is short grass, which is soft to fall on and prevents the breathing of dust. In a nursery school such surroundings are given to toddlers. They have grass to play on, suitable toys, low swings and seesaws, sand heaps and so on. Such a nursery school is the best adjunct of a welfare centre, but very few exist at present. If a space is available at the welfare centre, advantage should be taken of it to have something of the nature of a toddlers' playground. This is very useful while mothers with small babies are waiting, or when sewing classes are being held. It does, however, involve the need of voluntary or other helpers (see p. 162). When the children are old enough they may be taught simple drill, games and dancing. If a child is noticed to be flat-footed or to have a bad posture, special exercises can be given on which special books must be consulted. The smaller children usually prefer to amuse themselves in a solitary fashion, but for those of four and five games with others are the first lessons in self-control and 'team spirit.' Flowers cultivate the sense of beauty, the habit of observation, and arouse curiosity. Quite small children can be taught to care for them, and avoid needless picking of flowers and crushing the plants. What has already been said about fresh air and sunshine applies to toddlers equally with babies, so is not repeated here (see p. 11).

DIET

The general lines have already been indicated in the discussion of weaning. As the child grows older the diet approximates more to that of the elders. There are a few points which require special mention. *Milk* should be part of every child's diet. Many children in India suffer from lack of it, most often on account of poverty. It is impossible here to enter into the

question of a good and cheap milk supply, we must be content with stating what *ought* to be, though we cannot decide how it is to be accomplished.¹ The other prime needs are fruits, vegetables and cereals. Attention should be paid to the balance and caloric value of the diet, especially when there is any suspicion that the child is being either over- or under-fed. Among the poor the protein and fat ration is very apt to be too small, while the carbohydrate is excessive. The toddler's diet should be simple. Rich foods, excessive amounts of fried foods, sweets, highly-spiced dishes are not suitable. They not only upset the digestion, but spoil the taste of the child.

Meals should be at absolutely regular times and eating between meals forbidden. If the child refuses the food at the proper time he should not be allowed to eat it later on when he decides he would like to. Sweets, nuts or fruit should not be eaten at odd times, but form a part of the regular meal. Children should be taught to eat in a neat and orderly fashion. They should also be taught to feed themselves at an early age.

¹ An investigation carried out in Scotland showed that a group of children, who were given a pint of milk extra per day, increased more rapidly in weight than the control group who were not given the milk. In another such experiment the children receiving milk were noticeably more vigorous and alert.

CHAPTER XV

AILMENTS IN TODDLERS

MANY of the ailments of toddlers are similar to those of infants, but in some cases, e.g. in digestive upsets, the symptoms differ, and the method of dealing with the ailment has, of course, to be modified by the age of the child.

COMMON COLD

This has already been dealt with in Chap. IX, but repetition may help to impress the facts on the mind. The toddler seems to be even more liable than the infant to this form of upset. He has contacts with a greater number of people for one thing, and, owing to his power of running about, is exposed to changes of temperature. In winter, in North India, half the toddlers which attend a child welfare centre are usually suffering from colds. In many cases these colds appear to be chronic and nasal discharge is continuous. The cause lies probably in the fact that, after the initial infection, the mucous membrane of the nose never gets a chance to return to a healthy condition. Such cases occur among poor children who live in small houses or single rooms, which are shut up at night in the effort to keep warm. The air breathed is dry and stuffy, a condition which is in any case not conducive to a healthy mucous membrane. When the doors are opened in the morning and the toddler runs out, often scantily clad, he encounters cold, often damp, air. The sudden change causes a secretion of mucus, and the nose continues to pour it out until the warmth of the midday sun alters the temperature of the air again. The continued nasal discharge obstructs the passages and makes the child breathe through his mouth. The air goes unwarmed into the larynx, trachea and lungs, and may set up a secretion there in the same way, which results in a chronic cough and may end in bronchitis. Constant colds lead to inflammation and enlargement of the tonsils and adenoids, with very detrimental effects on the child's lung expansion and general health.

As already stated, colds can to a large extent be prevented by correct hygiene. Cold air itself does not give a child a cold, and

even sleeping in cold air is not only harmless but invigorating and health-giving. It is the warm, dry, stuffy air which is harmful. Cold air increases the child's general resistance, creates appetite and so leads to better nutrition. The better-to-do people need much teaching on this subject. If they would but put the child to the test, they would prove the truth of the above statements. With the poor it is harder to press this advice, because the lack of bedding forces them to shut up the doors and windows to keep warm.

The other preventive of colds is to keep away from infection! This is possible in the sense that we can keep children out of crowded places, such as cinemas, wedding feasts, etc. But usually it should fall to the sufferer to keep from infecting others, though it seldom occurs to him to do so!

A child with a heavy cold can be kept in bed for a day or two away from other children; he should not play with them as long as there is profuse discharge or coughing. He should cough or sneeze into a handkerchief, old rag or soft paper. The latter two are really best, for they can be burnt after use. This is to prevent the spread of the infection by 'droplet' infection. For the general treatment of colds, see p. 80.

In conclusion, mothers should be taught that colds are not to be regarded as inevitable, slight disturbances which are of no real consequence. Even if a cold is not followed by any of the more serious effects such as bronchitis, middle ear disease, enlarged tonsils, it should not be thought that it is harmless. Repeated colds lower the child's general health, prevent proper lung expansion, and must damage the mucous membrane.

CONSTIPATION, INDIGESTION, DIARRHŒA

The digestive organs in a toddler are becoming accustomed to a greater variety of foods than in an infant. But this very fact carries with it the danger that they may be overtaxed. Hence the need to have simple easily digested food, and to watch for signs that the food is not agreeing with the child.

With regard to *constipation*, a child who has been well trained as an infant should have formed a habit which will last him throughout his childhood, if not throughout his life. It is the mother's duty, however, to see that the habit is persisted in. The toddler is not so docile as the infant, and if he wants to play

or do something he is interested in he may be apt to be impatient at the need for a daily movement of the bowels. Such resistance needs great tact and care on the part of the mother. If she goes about it the wrong way she may make matters worse. Refusals to attempt the daily action must not be confused with true constipation. In the latter the motions are hard because they have been deprived of water through being unduly retained in the bowel. The longer the fæces are retained the more reluctant the child is to make the attempt, owing to the pain caused. Such constipation can usually be overcome by dietetic means. Plenty of vegetables should be eaten on account of the 'roughage' they contain. Fruits and fruit juices are laxative and extra water must be drunk. *Chapatis* made from wheat are more laxative than rice. Porridge or *dalya* is also good. The child should chew his food thoroughly. An attempt should be made to move the bowels at the same time each day. Purgative medicines should be avoided, especially castor oil, but liquid paraffin is harmless and may help to establish a habit. Cod-liver oil and malt is helpful, both on account of its general tonic effect and because it is laxative.

Indigestion. The health visitor must be on the look-out for symptoms of indigestion, though she naturally cannot treat it but must refer the case to a doctor. Indigestion involves both the stomach and intestines, and the part played by the latter is probably the more important. *Acute* indigestion is usually set up by the eating of too rich or unsuitable food. Sometimes it is caused by eating when too tired or excited. The child vomits the food first, but may continue to vomit after the offending material has been rejected. The child complains of abdominal pain, the tongue is coated and the breath foul. There is usually some diarrhœa, and the motions contain undigested food and may be mixed with mucus. Mothers should be warned not to press food on the child in such attacks. If medical advice cannot be got, a dose of castor oil is to be advised (one to two teaspoonsful). Warm water with some sodium bicarbonate in it is helpful. If vomited, this does not matter, since the stomach is cleaned by it. The child should be kept quietly in bed.

Chronic indigestion may be due to several causes. The question is too complicated to be considered here. The treatment of such cases is a matter of considerable difficulty, because

it lasts a long time and is almost entirely dietetic. The health visitor can help the mother by encouragement and interest and she can, by her visiting in the home, see that the doctor's orders are carried out. She can also keep the weight chart, observe the stools, and report generally to the doctor. In many cases of chronic indigestion, among children attending welfare centres, the cause is obvious, namely, want of suitable food. When the family income is limited many children receive no milk after weaning. Their chief foods are bread made from wheat or rye, *dals* and coarse vegetables. All these contain a good deal of 'roughage,' which induces a feeling of repletion, and therefore satisfies hunger. But such a diet produces bulky stools, fermentation is set up and the mucous membrane is irritated. The children who show protruberant abdomens, so frequently seen in India, are fed on such diets. The stools are often loose and the children do not gain in weight. Could they be put on a suitable diet the symptoms would disappear and the weight chart show an improvement.

Among the better-to-do people indigestion is sometimes the result of bad upbringing. The child dictates what he will or will not eat, and the parents yield. It requires a lot of persuasion to make a mother break bad habits of this kind, but no other course is of much help.

Diarrhœa in toddlers, though not quite so alarming as in infants, must always be taken seriously. The diarrhœa may be a simple one set up by the irritation of unsuitable food, or caused by a chill, or it may be an acute infection, causing a severe enteritis. Diarrhœa may be the precursor of several diseases of the bowel, such as cholera, dysentery or enteric fever. If a doctor's advice cannot be obtained quickly, the health visitor may give an initial dose of castor oil. She should advise the mother not to give the child anything to eat or drink except water for 24 hours. For the prevention of acute diarrhœa see Chap. VIII.

Chronic diarrhœa is a symptom of chronic indigestion, as noted above.

INTESTINAL PARASITES

Infection with worms of various kinds is much commoner among toddlers than among infants, because they often play in dirty surroundings and carry the infection to their food from

unwashed hands. The two commonest infections are from thread worms and round worms. *Thread worms* are so called because they resemble small pieces of thread or fine shreds of cotton. Mothers frequently say that their children have thread worms because they mistake shreds of mucus for the worms. The chief symptom of the infection is irritation of the anus, especially at night. If the mother complains of this symptom in the child, the health visitor should try and see the stools to make the diagnosis certain. The medicine usually prescribed, Santonin, may be got from a doctor or a dispensary, and given at night. The health visitor can give the child an enema in the morning, containing 2 drahms of salt and 1 drachm of sodium bicarbonate to a pint of water.

Round worms resemble earth worms, and are more easily recognised. Treatment is the same as for thread worms.

In both cases the opportunity should be used to teach the mother the reason of the infection and how it can be avoided.

Hookworm infection is very common in some parts of India. It is serious on account of the anæmia it causes. In districts where it is common health visitors must remember the possibility and have the children examined. Hookworm infection offers excellent opportunities for practical health lessons to mothers, since it is the direct result of faulty hygiene.

The common accidents of childhood, cuts, bruises and burns, are not dealt with here, since they have been considered in the first aid course.

Four *infectious diseases* to which small children are very liable are often seen at child welfare centres. These are measles, whooping-cough, chicken-pox and mumps. Infants as well as toddlers suffer, especially from the first two named. All are very infectious, and practically no attempt is ever made to prevent the spread of infection. Yet measles and whooping-cough are a real danger to young children. Every effort should be made to protect children under six contracting either disease. The pneumonia which so frequently and fatally follows measles is not understood to be an after-result of these diseases. Every spring an epidemic of measles is accompanied by deaths of small children, and deaths which are really due to it are notified as being the result of pneumonia, so that the mortality rate from measles is even higher than is commonly supposed.

Measles starts like a common cold, with running at the eyes and nose, sore throat, and perhaps cough. After about three days the rash appears on the forehead and chest and spreads all over the body. The temperature rises and the child feels decidedly unwell. After two days the rash begins to fade, the temperature falls, and after a week the child is normal again. The child should be kept in bed but given lots of fresh air; if the weather is warm the bed may be in the verandah, but the eyes should be protected from light, as they are often inflamed. The eyes may be washed frequently with boric lotion and protargol drops instilled. When there is fever the child should be kept on milk diet, given plenty of water to drink and fruit juice. While recovering he should be given light, easily digested food, and be very carefully protected from cold. The great danger after measles is that the child should develop bronchitis or broncho-pneumonia; this is why nursing is so important. Another danger is middle ear disease. The infection spreads from the throat or back of the nose along the Eustachian tube to the middle ear. Pus develops and the drum perforates, discharging the pus by the outer ear. There is no certain method of guarding against either pneumonia or ear infection, but care in protecting the child from cold will help.

Whooping-cough lasts much longer (about six weeks) and is more trying to both mother and child. It begins as an ordinary cold and cough. If a child has a cough which lasts a long time, does not yield to ordinary medicines, is worse at night, and followed by vomiting, whooping-cough may be suspected. The characteristic 'whoop' develops ultimately. The child is often very pulled down, owing to loss of food through vomiting and loss of sleep through coughing. The child should have as much fresh air as possible without getting cold, and there is no need to keep him in bed unless he has a temperature. Bronchitis and pneumonia are to be feared, as in the case of measles. During convalescence, extra diet and cod-liver oil and malt should be given to make up for the loss. A change of air is very helpful.

Chicken-pox is less serious than the two foregoing. There are usually no symptoms, but a rash appears on the first or second day of the illness on the face, head or back, and spreads over the whole body. It consists of small, reddish pimples, which fill up with a yellowish fluid and then dry up. There is a slight

rise of temperature. There are seldom any complications, but the spots may be irritating and the child must be kept from scratching them.

Mumps is also not very serious, but may be very painful for a few days. It begins with pain and swelling in the angle behind the jaws and below the ears. The child experiences difficulty in swallowing. There is a slight rise of temperature. The symptoms subside in a few days.

CHAPTER XVI

THE TRAINING OF INFANTS AND TODDLERS

IN some health training schools in India a course is given on psychology. One of the reasons for the establishment of such a course was that health visitors might understand the development of the child mind, the reasons why training helps in character formation, and why the attitude of some mothers towards their children has so disastrous an effect on the children's character. The more insight a health visitor has into the 'motives and mechanisms' of the mind, the more helpful she is likely to be to mothers in this great question of upbringing of children, and, what is very important, the more understanding will she be about their failures, and the results of their failures, namely, the spoilt, wilful, uncontrolled child; the timid, shrinking child, who easily slips into deceit; and the rebellious, defiant child, to name only a few.

We cannot here give even a summary of what the health visitor should learn along these lines. What we want to do is to try and show the importance of training to the child's body first of all, how that training should begin at the beginning of life, and how such training in bodily habits passes gradually into character-training and self-discipline.

Both in this book and in the daily practical work of health visiting the student will have noticed, over and over again, the stress which is laid on *regularity*, on doing the same thing at the same time daily, on having the intervals for sleep and food the same every day. There is a double reason for this. We know that it is better for the infant's digestion that he should be fed at proper intervals, and for his growth that he should sleep the proper amount at the proper times. These are physical reasons. The other reasons are mental or moral ones. We know that if a baby is only fed at regular intervals he learns not to expect food at other times; if he is made to sleep at the same time daily, he does so without question. He has learned two *habits* which are certain to be helpful to him in later life, and he has learned them without knowing it. Early training consists in the formation of

good habits. The body gets accustomed to expect food at certain times and at regular intervals, and there is positive discomfort often if such habits are upset. Sleep, too, is largely a matter of habit. The child accustomed to sleep at a regular time feels sleepy at that time, and will sleep even in the presence of light and noise. The same holds good with the action of the bowels. If a regular habit is formed in infancy it is quite likely that the habit will last throughout life. Habits connected with food, sleep and the bowels are those which concern the infant first, and on which depend to a considerable extent his physical progress. Details as to training in these matters, and the difficulties, some of them genuine enough, which are met with in the process, are found elsewhere so need not be repeated here.

The importance of the formation of habits at the *start* of life is very hard to grasp. Yet on that depends almost everything. The mother who feeds the baby every time he cries will also allow the toddler to eat whenever and whatever he likes. The one who lifts the baby when he cries and allows him to share her bed is not likely to adhere to a proper bedtime later on. While always bearing this in mind, the health visitor should have sufficient imagination and sympathy to see that what she is asking the mother to do is a very difficult thing, especially if the confinement takes place at home. The mother has to face a situation which requires endurance, patience and self-control just when she has emerged from an emotional and physical strain, and is least fitted to do so. If at the same time she has to cope with household duties and other children, and withstand the preconceived ideas of elders in the family, is it any wonder that her heart often fails her, and she is not able to do what she really knows to be best? The health visitor must give every encouragement she can and praise every small victory which the mother gains. She should also do all in her power to enlist the help of the father, especially young, educated fathers, who provide fruitful soil for the growth of new ideas and are able to give their wives valuable backing and advice.

The stress which must be laid on the early beginnings of training are all the more necessary because the lack of them is not always immediately visible, and mothers are apt to think that training need only be started when the child has begun to show independence in thought and action. The glaring results of lack

of training show themselves at the toddler age. Every health visitor knows the small child who is a trouble to himself and all around him because he has not been taught. The mother is helpless before such a child, who is a veritable tyrant. Only too often she tries to secure obedience by lies and threats, thus destroying, if she could only understand it, the child's respect for and trust in her.

Parents have often very mistaken notions as to what is meant by training and discipline. They think that discipline involves harshness and want of love. They do not realise that training the child as a baby enables him to be the minimum amount of trouble to himself and to others, to control his own impulses and guide them into right channels. Whatever parents do, habits of some kind are formed by the repetition of certain thoughts and acts. Why not form good habits—why allow bad ones to be created? People seem to think it is difficult to form good habits, while they admit it is easy to form bad ones. But is the one process any more easy or difficult than the other, and does it not lie in the hands of the parents, especially the mother, to allow either the good or the bad to arise? The willingness to take trouble to train a child shows far more real love for him than the indulgence which is so often falsely given the name of love. Sooner or later a child has to face life himself or herself. Indulgence prevents him gradually learning what reality is, and deprives him of the means of meeting situations in real life later on. Just as discipline does not mean harshness or prevention of self-development, so does freedom for the child, about which we hear a good deal nowadays, not mean that he should do just as he likes. Every child has to be kept from doing things which are bad for his health or are 'anti-social,' that is not in the interests of society as a whole. But he should be free to develop in his own way, and should not be hampered by mere conventions unsuited to his age.

CHAPTER XVII

THE HISTORY OF THE CHILD WELFARE MOVEMENT

SINCE child welfare work in its modern aspects has been introduced into India from the West, we have to seek its origins there before attempting to trace its progress in India itself.

Public health in Great Britain was established firmly after the passing of the Public Health Act in 1875. In that Act the preventive method of dealing with disease was for the first time fully recognised. For some time after its passing, however, the principles were applied to the larger general aspects of hygiene, e.g. the control of epidemics, provision of proper water supplies, safeguarding of food, disposal of refuse and sewage, etc., and not specifically to infant life. As a result the general death-rate among the population fell, but this was not accompanied by a corresponding fall in the death-rate of infants under one year. At the same time the birth-rate continued to fall in England and other European countries. In France, particularly, these facts led to attention being drawn to the necessity of preserving infant life by special means. This took the form, in that country, of the establishment of 'infant consultations,' where breast-feeding was encouraged and advice was given to mothers on the subject. This was followed by similar consultations for bottle fed infants, and in addition milk was supplied either free or at reduced rates. In Belgium 'Schools for Mothers' were started. Here the idea was recognised, at the very outset of child welfare work, that the education of the mothers, or mothercraft, was one of the most important factors in any scheme for reducing infant mortality.

Although these efforts were made in recognition of the knowledge that infant life must be conserved if a nation's manpower were not to decline, this was not the sole motive leading to the establishment of child welfare work. During the nineteenth century philanthropic movements of many kinds had originated, protection of children in industry, prison-reform, the rise of the nursing profession, etc., and the realisation that many infants died needlessly, must be regarded as a part of the same humani-

tarian impulse. In England the movement certainly owed its inception to this motive, rather than to any consciously thought-out policy of saving child life to compensate for the falling birth-rate. In that country some milk depôts were started about the end of last century, and then, or a little later, child welfare centres, or clinics, corresponding to the infant consultations, were begun. Home visiting was also undertaken. During the first decade of the twentieth century the numbers of centres increased rapidly. A great proportion of the work was undertaken by voluntary societies. This is a very characteristic method in England: voluntary societies start a piece of work, and when its worth has been proved it is taken over by the authorities, in whole or in part. In the early days much of the work was done by untrained volunteers.

The safeguarding of the mother during pregnancy and childbirth developed hand in hand with child welfare work in England from the beginning of this century. The Midwives Act of 1902 provided for the better training of midwives, and the control of their practice. Antenatal work is regarded as a most essential feature of child welfare work, and antenatal clinics have been established all over the country.

Several factors hastened the development of the care of the infant, and one of the most important was the establishment of medical inspection in schools. This was begun in the year 1909. As soon as systematic inspection of school children was undertaken, it was found that a very large proportion of the children entering schools were suffering from some preventable disease, which could have been avoided by suitable measures taken earlier in the child's life. The medical inspection of school children therefore tended to direct attention to the problem of securing healthy childhood for children under school-going age.

The upheaval caused by the Great War of 1914-18 also influenced the development of child welfare work. The Notification of Births (see p. 178) was made compulsory in 1915, whereas previously it had only been adoptive, and early visitation of all newly-born infants was thus secured. During the War years the amount of child welfare work increased, because it was realised that the waste of the War in human lives must be repaired. In addition, the fact that such a large proportion of recruits were physically unfit became known to the public, and the feeling

grew that such defects must be attacked at their source, namely, in infancy. The Maternity and Child Welfare Act of 1918 consolidated much that had been growing in the previous years. It suggested schemes for maternity and child welfare work, outlined the duties of health visitors and laid down regulations regarding their training. The Ministry of Health came into being in 1919, and its creation, though it had been long advocated and was urgently needed, was undoubtedly hastened by the events of the Great War. Since then more legislation has provided in various ways for the care of mothers and children.

Local authorities, both urban and rural, are required to undertake maternity and child welfare schemes and provide for the supervision of midwives, as well as perform a large number of other functions, all of which are directed to secure health for mothers and children. These are too numerous to mention here, but what is necessary to notice is, that while local authorities must undertake such work, the central authority, the Ministry of Health, retains power over the local authorities, inspects their work and gives them grants-in-aid. The grants-in-aid may be withheld if the work is not properly carried out.

In India things began in a somewhat similar way to England—that is, through the efforts of voluntary workers. They were, many of them, the wives of officials, who had seen and heard of the movement in the West and were anxious to apply the same methods to lower the terrible infant mortality in India and relieve the useless suffering of women and children. Voluntary societies were formed to start child welfare work, and in some cases municipalities undertook it. Nurses were employed in clinics or home-visiting. Maternity homes were started and fresh efforts were made to train indigenous midwives. There was very little which was systematic about these first efforts. The clinics were often conducted without any help from doctors, and the supreme importance of home-visiting was not realised. There was no central organisation to which application could be made for help or guidance, and those employed to do the work knew very little about it. This lack of properly trained workers led to the establishment of training schools for health visitors, of which that at Delhi was the first. Lady Chelmsford, wife of the Viceroy (1916–21), was keenly interested in the subject, and founded a League to promote child welfare. This League is now

incorporated with the Indian Red Cross Society. Health visitors' training schools now exist at Lahore, Calcutta, Madras, Nagpur and Poona as well as at Delhi.

In such a large country as India the work naturally varies very much from province to province, and welfare work on the whole is weakest where the province is poor and women's education backward. Even in the large provinces there are great differences in the amount and standard of the work. In some provinces most attention has been paid to midwifery, and the starting of maternity homes and supplying of trained midwives has been the principal object. In other cases health education has been prominent, in still others the supply of milk. The way in which child welfare centres are carried on also varies greatly, and in very few cases is the ideal child welfare centre found. Frequently too much treatment is done at centres and unnecessary amounts of money are spent on milk; workers are not always properly trained or efficient, and medical women with training in health work are not sufficiently employed. Elsewhere an account of the various activities of a child welfare scheme will be found, but students must avoid thinking that there are many such perfected schemes in which they can find employment. Rather they will find that they have themselves to build up the work, and this takes much time, effort and patience. Neither must they be ready to blame others for schemes which seem to them far from ideal. Those who began the work had not the advantage of expert knowledge or experience, and they did what they could. In India, too, the public support given to such schemes is often very meagre, and their real object is misunderstood by the people themselves.

These difficulties can only gradually be overcome. Each health visitor doing faithful work brings the time nearer when every mother in India will have the opportunity to be educated in mothercraft and every child led in the path of health.

CHAPTER XVIII

THE AIM OF THE CHILD WELFARE MOVEMENT

BEFORE considering in detail the question of the various activities of a child welfare scheme, it is as well to consider once more what we are aiming at in this movement. Those who engage in it have often very hazy ideas as to what this is, and, although well meaning and enthusiastic, they have no considered policy to proceed upon. Often the motive is a vague feeling that 'something ought to be done,' but why, and what the 'something' should be, is not subjected to close scrutiny. In other cases the motive is less worthy, the work is undertaken merely because it is being done in other places by voluntary societies or municipal committees. Such persons have very little idea of what is to be gained by 'child welfare,' and this leads to little that is really useful or permanent being achieved.

In Western countries, as we have seen, the primary cause which led to the establishment of child welfare work was the effort to reduce the death-rate among infants. As Dr. Lane Claypon remarks, 'As civilisation progresses the value placed upon life is increased, and a high death-rate comes to be regarded as a blot on the nation and produces efforts to bring about its reduction.'¹ This is certainly true; the more a people advances, the greater is the value it places on the lives of its citizens and the less willing is it to sacrifice lives needlessly. In addition, the means of preserving life and adding to its duration become available as education becomes general, scientific discoveries increase and are applied to the lives of the people. This process is accompanied by, and can scarcely be distinguished from, the spread and deepening of humanitarian feeling. At the time of the first attempts towards child welfare work the great idea of prevention had not caught the imagination of either the medical profession or the public. Antenatal work, now so important a part of our schemes, was scarcely thought of. The work of medical inspection of school children had not

¹ *The Child Welfare Movement*, by Dr. J. E. Lane Claypon.

been begun, their preventable physical defects had not been brought home to the public. Work among children of pre-school age was undreamt of, for its need was not appreciated. Lastly, the great branch of popular education in health matters was untouched. All these came later, and are now an integral part of the whole movement. We, in India, can have the benefit of learning by the experience, and also by the mistakes, of the West. It may not be desirable for us to follow in detail methods which have been found successful in England or Germany, but we have at least the advantage of seeing the whole field mapped out before us, and need not remain in ignorance as to the main lines to be followed. Nor need we be doubtful as to what we wish to achieve. It is, shortly, to reduce the infant death-rate by all means in our power, and to attempt to raise up a generation of children strong and healthy and able to take a worthy part in the life of the nation.¹ We aim at preserving the health of healthy infants, and this involves education of the mothers of India in all that pertains to health and in the means to be taken to avoid unnecessary illness.

In India there is so much ill-health in our midst that it impresses itself upon us at every turn. The first thought of the majority is to deal with this ill-health as they see it, and therefore we have seen hospitals and dispensaries spring up everywhere, a great increase in the number of private practitioners, and always a demand for more. People are usually ready to pity the suffering and to try and help them. It needs deeper thinking and more imagination to strike at the root of this ill-health and try and destroy it at its source. That increased facilities for treatments have not always been able to check the death-rate is shown by the figures for the Punjab, where in 1924 the deaths outnumbered the births² (birth-rate 40·5 per mille, death-rate 43·43 per mille). The reason adduced is that the province has been visited by epidemics of plague, malaria, influenza, etc., which account for the very high death-rate. But these

¹ A high infant mortality rate implies (a) the loss of many infants; (b) the maiming of many surviving children, for conditions which kill some, injure others; (c) a high death-rate in the next four years of child life; (d) the existence of unhealthy conditions in the mothers and in the home life of the people. (Sir George Newman, *An Outline of the Practice of Preventive Medicine*.)

² *Report of the Public Health Commissioner, 1924.*

are all preventable diseases, and only strengthen the case for measures which aim at prevention rather than cure. It cannot be too often insisted that prevention is and must be the guiding principal in all child welfare activities, and that the child welfare movement is in fact only part, though a large part, of the practice of preventive medicine for the whole people. Insistence on this, in season and out of season, is the more necessary because in India one so frequently sees the movement degenerate into an agency for dealing inadequately with children's ailments, or for doling out charity which is demoralising to the recipients and achieves very little in the building up of real health. The universal, and only too human, custom of allowing illness to develop and then seeking for treatment, together with the poverty of the people, assist both of these tendencies strongly.

There are numerous other hindrances, as can be seen all through these pages, to the development of child welfare work, such as lack of proper workers, inability or unwillingness to spend money on the work, ignorance on the part of the people as to the object of the work, and so on, but the three just mentioned are the most important because they strike at the root of the problem. If the work is begun on wrong lines, without the principle of prevention as its basis, if it becomes a charity, and if it is not regarded by all as part of a campaign for public health, then skilled workers, money and other advantages will not help us much; in fact they will only be misused and mis-spent, and the last state of affairs is not likely to be better than the first. Far better have slow and small beginnings on right lines than expensive schemes which achieve nothing for future generations. A criticism that is sometimes levelled against the movement is that it encourages the survival of the unfit, that India is over-populated as it is and that 'natural' means should be taken to reduce the numbers. Others go even further, and say frankly that what India needs is not child welfare but birth control. The meaning of all this criticism is that numbers should be kept down. This may or may not be the case, but it does not affect the arguments in favour of child welfare. Behind the criticism lie two fallacies. First is the fallacy that child welfare workers are concerned only to save infant lives, and, second, that the means taken to save these lives do not improve the health of other infants, who, though not actually dying,

would grow up feeble and unhealthy. Even if more babies are not wanted, no one wishes to see children grow up feeble and unhealthy. If, in attempting to secure health for all children, we save the lives of some, surely that is no reason to desist from our efforts. The question of birth control as a practical problem need not concern us here at all, but in passing we may remark that, even if it were desirable and possible, it would not necessarily follow that the remaining infants would be brought up in health.

Two tendencies are noticeable in recent health work. One is the increasing conviction that the division between prevention and cure is largely an artificial one, and that the two are mutually interdependent. The other is the wider view now taken of public health work and, especially since it concerns us, of child welfare work. These two tendencies are less apparent in India than in the West, but they are certainly influencing both public health and medical work in this country, and it is important that they should be realised.

It is a regrettable fact that in the past hospitals and welfare centres have not co-operated in the most fruitful way for the benefit of the women and children of the country. Each has to gain by doing so, and most of all the persons concerned for whom both are working. There should be the fullest co-operation between the two. Their functions are not identical but they are complementary, and neither can do without the help of the other. The misunderstanding on the part of the public as to what welfare centres exist for is partly at least due to wrong methods of working. Where the right ones are tried, the public generally realises the work which the hospital and the welfare centre perform, and where the one carries out what the other does not attempt. Health visitors have a great part to play in helping forward such co-operation. In having it clearly before themselves as an aim they will be able to make it clear to others, and the creation of a generation of healthy children will be made possible.

The wider view of her work which the health visitor should take is indicated in Chap. XXI, so need not be dealt with here.

The need for trained workers has been mentioned. Many of those who read this book are undergoing training for child welfare work, and they will be the first to recognise the need

for that training. It would be a mistake, however, for health visitors to imagine that the mere acquisition of knowledge will make them into the right kind of workers. Qualities of character are every bit as important as book knowledge, and indeed it is only the person with the right character who can use her knowledge successfully. The worker may frequently be discouraged by the ignorance, apathy and prejudice of those among whom she works, but she must try to overcome these stumbling-blocks with friendship for the people and enthusiasm for her task. She must never forget that many apparently irrational habits are deeply rooted in social and religious customs, which formerly had their uses, though time and altered conditions have rendered them useless at the present day. An ample supply of common-sense, kindness and a sense of humour are the greatest assets to a health visitor.

CHAPTER XIX

THE CENTRE AND ITS WORK

WE have attempted to show what we are aiming at in carrying on health work among women and children. We must now endeavour to indicate how that aim is to be fulfilled.

The majority of child welfare schemes in India work along three main lines:

(1) The establishment of a welfare centre; (2) the carrying on of home visiting; and (3) the training and supervision of indigenous *dais*. Many centres carry on other activities, but these are the three most important ones.

We shall deal with the work of the centre in this chapter. It must always be realised, however, that although we divide the work into chapters in a book, we cannot thus divide it in real life. Centre or clinic work goes hand in hand with home visiting, each is lacking without the other and they must dovetail into one another. The connection with *dais* training is perhaps less obvious, but it is none the less of considerable importance, as we shall see.

In starting a child welfare centre the building must naturally be thought of first. The situation must be carefully selected. Very few women are able or willing to walk far to a centre. It should, therefore, be accessible to as many people as possible. The nature of the building depends on the resources of the committee running the scheme. A very few centres are built for the purpose, generally a house has to be adapted. This can usually be done with a fair amount of success. The size of the house and the number of rooms depend on the amount which the committee is able to afford as rent. A house which has a private courtyard is the best. This affords privacy for those who are waiting, and provides a place for children to play and have sun-baths. In an ideal centre there would be three rooms, a large bathroom, and a large verandah or courtyard for waiting patients. A small stock- or store-room is convenient also. One room should be used for weighing infants and toddlers, a second for examining the children and antenatal cases, and a third for

minor ailments, feeds, etc. If the health visitor is single handed she may have to work in two or even one room. The mothers and children should be admitted singly, or at least in families, so as to secure the necessary quiet. If a helper, voluntary or otherwise, is available, she can be used to superintend the bathing and entrusted with the weighing of the children. If the health visitor has only a *dai* or *ayah* to help her, she will have to do the weighing herself. The *ayah* will give help and keep order in the bathroom, but the health visitor should pay surprise visits to the bathroom to see that everything is being properly carried on. It must always be remembered that the personality of the worker is of far more importance than either the building or the equipment. With the right worker, good work can be done in a shed, or even in the open air under a tree.

BATHING

There is a certain amount of disagreement on the subject of bathing. Some hold that it is unnecessary, and that mothers should learn to bring their children clean to the centre. There is some truth in this, but the fact remains that in a poor district bathing facilities are a boon. Space, water, soap and towels are provided at the centre, and they are not costly. A poor mother, if she bathes her baby at home, may have to carry water for the bath from some distance, she may not be able to afford to warm the water, nor to buy soap and towels.

Those who criticise the provision of baths perhaps do not visualise the difficulties of a poor mother in a one-roomed house. For the middle class bathing at a centre is unnecessary, and the mothers do not avail themselves of the facilities. But most centres in India still cater for the poor.

The bathroom should be large enough to allow of several children being bathed at once. It should have a raised kerb, to prevent the whole space being flooded. Buckets and *lotas* should be provided for the bathing and plain soap. Some centres give a little saucer of liquid soap to prevent stealing of soap cakes. Stools can be provided if liked for the children who can sit, but many mothers prefer to use their feet in bathing the children. Older children should be gradually taught to bathe themselves. Each child should have its own towel and small comb, which can be kept in a bag. Scissors with blunt points may be provided

for cutting nails. In cold places warm water should be provided, but *angithis* should not be allowed in the bathroom itself. Bathing should be done by the mothers themselves, or, in special cases, by elder sisters. Bathing should never be done by *ayahs*. The mothers quickly learn to bathe the children, and appreciate the facilities provided.

In some centres the mothers are allowed to bathe in the afternoons, when centre work is over.

Weighing is one of the most important activities in a welfare centre. Teaching of mothers can be done in the home, but weighing cannot, and for this reason alone regular attendance at a welfare centre is essential. Dr. Cassie says: 'There is no means of ascertaining normal progress in infants at once so simple and so accurate as the weight curve from week to week.' The health visitor must be prepared to give the mother her reasons for advocating weighing in clear and simple language. The mother must be made to realise that the scales are more accurate than her estimation of the child's progress, that they tell her whether the child is getting the right food in the right amounts, and whether his health is good. Weighing will also prevent needless worry and sometimes needless weaning, whereas it will give warning when the supply of breast-milk is becoming insufficient.

When weighing was first started there was a good deal of prejudice against it. Mothers were afraid of the 'evil eye.' That prejudice has to a large extent disappeared, and mothers are becoming interested in weighing and understand its value. There is still, however, a prejudice against undressing babies for weighing. This, however, is absolutely necessary for accurate work; weighing in clothes is worthless.

In cold parts of India the weighing should be done in a warm room; one cannot expect mothers to agree to undress babies in a cold one. The baby can be wrapped in a shawl, which can be weighed separately. Always keep a pencil and paper on the weighing table and jot down the weight quickly, otherwise it may be forgotten before there is time to write it down on the child's card.

The type of scale used is very important. Unfortunately there are far too many clock-face or spring balances in use. The bar and balance scale should always be used. These are not

cheap and many committees object to their cost. It is better to economise on anything almost rather than the weighing scales. The weighing scales must be capable of weighing accurately down to two drachms, so that test-feeds may be carried out. They should weigh up to 30 lbs. at least. Some scales can be used both for toddlers and babies; otherwise a separate scale must be provided for toddlers.

Great care must be taken of the scales. They must be lifted very carefully when necessary, the weights must not be banged on to the pan—nor the baby! The scales should be put on a low table, so as to avoid lifting the babies high in the air while placing them on the pan. When preparing to weigh a baby, arrange a towel on the pan and place the approximate weights, as seen from the last weighing, on the other pan. Place the baby, wrapped in a shawl or blanket, very gently in the pan, supporting the head. Add or remove the weight required, supporting the pan with the other hand, so as not to jerk the infant. Lift the baby gently out of the pan and give him to the mother. Note the weight, and deduct that of the towel and shawl. Enter the weight on the card.

In some centres a piece of paper is placed between the baby and the towel, and changed for each case. This is certainly hygienic.

In most cases the weight is entered on the child's record card. This gives the weight in *figures* only. A card ruled to show a curve is more graphic, and is appreciated by educated mothers. They may be allowed to take such cards home.¹ Weighing should be done weekly up to one year, and then fortnightly or monthly.

Height should be recorded in the case of toddlers. It is generally too difficult in the case of infants. Heights should be measured three or six monthly.

THE TREATMENT OF MINOR AILMENTS

This is another question which has been the subject of much controversy. The practice of centres still varies a good deal, and many health visitors are horrified, when they go out to work, to find that they are expected to run a regular dispensary. This, of course, is quite wrong, and no health visitor should be asked to

¹ Suitable cards can be obtained from the Red Cross Dépôt, Lahore.

do such work. In the best centres a doctor attends at least weekly, and then it is possible to give treatment with safety. At the same time, even the presence of a doctor should not allow the centre to be transformed into a dispensary. The primary object of a centre is teaching and advice, and we have to train mothers to appreciate this fact. A profusion of medicines leads the women to attend only when their children are sick, and so there is not continuous teaching or observation of the children, and the centre fails in its purpose.

There is, however, a real and legitimate scope for the treatment of minor ailments at centres, and even without the help of a doctor, who in many cases is not available, a health visitor can do a good deal. She must always be careful not to undertake anything that is beyond her skill or knowledge. A fairly safe rule is for a health visitor only to undertake what any intelligent educated mother does, and can be trusted to do, in her own home.

The arguments in favour of giving treatment of minor ailments at a centre are as follows: The mother, if a regular attender, trusts both the health visitor and the centre doctor. She feels vexed when told to go to a dispensary when she has already come to the centre. She may have to wait for a long time at the dispensary and in the end she may not get satisfactory advice. The ordinary doctor at a dispensary cannot pretend to be a specialist, and he has very little time to spend on petty ailments. In the case of discharging ears or eyes, the baby is probably getting more careful treatment at a welfare centre than in a dispensary. Health visitors should, in the great majority of cases, be competent to distinguish between a minor ailment which they can safely deal with and a serious trouble requiring expert advice and prolonged treatment.

In the latter case, it is the duty of the health visitor to see that the child really secures the treatment required. It is not enough to say to the mother that the child must go to hospital, she must in many cases make time to go with the mother and child herself.

The details of the administration of minor ailments are not described here, since these are learnt in the practical training.

After a centre has been running on proper lines for a while, the mothers who attend regularly learn that only minor ailments are treated, and accept the fact.

TEACHING AT THE CENTRE

This is really the most important work to be done and if it is not done the centre is failing in its real purpose. It is not very easy to write about however. Experience is needed as well as tact, sympathy and the ability to get into touch with mothers and understand their difficulties. A hectoring and scolding manner is worse than useless, though the temptation to scold is very strong at times. The best teaching is done to individuals. It is impossible to give much time to each mother at each session; the health visitor must arrange things so that selected mothers are given extra time in turn. A very few lessons should be dealt with at any one time, and they should be pointed with homely illustrations taken from real life. Always give as much praise and encouragement as possible, it has a big psychological value. The mother who is dealing with a delicate or premature baby needs it specially.

Group teaching is not easy, and it is especially difficult to give at the ordinary sessions. The mothers are eager to have their babies seen and weighed, and are not in a mood to give their attention. A more hopeful opportunity is the sewing class, or, for the more educated, a simple class directly for mothercraft or simple home nursing (see Chap. XXI).

Teaching at the centre should be amplified in the home visit. The worker can make a note on the card as to what points especially require to be stressed and refer to the card again before going to the house.

The actual procedure in centre work is usually as follows: on coming to the centre the mothers show their tickets, which have numbers corresponding to those on their cards (either antenatal, infant or toddler). These tickets may be of paper, cardboard or metal, preferably stout cardboard, and are given to the mothers to keep. The cards are not taken away from the centre, but looked out when the mother comes. She is then either seen at once and the baby weighed, or she goes to the bathroom to bathe the baby, and then returns to have the baby weighed and seen. If any minor treatment is required or a feed is to be given, she passes to the next room for this purpose.

The practice of centres varies a good deal as to whether the centre is opened daily or not. If bathing is carried on and feeds are given, the centre must obviously be open every day. This

does not mean, however, that each child need be seen daily. One or two days a week may be appointed as 'clinic' days, when the antenatal cases and children are examined. On the other days the mothers and children may be admitted simply for bathing, minor ailments (e.g. eye treatments or dressings) and feeds, if such are given. Where there are no baths the centre can be altogether closed except on 'clinic' days. The advantage in the latter case is that the health visitor has more time for home visiting. But even when the centre is opened daily the session need not be a prolonged one.

A doctor should attend the centre on at least one clinic day. This is by no means universal as yet, but it should be the case and the health visitor should always press for this, for her own sake as well as for that of those attending. When a doctor attends the health visitor should weigh the infants and toddlers, and pass them on to the doctor with the weight filled in on the cards. The doctor can retain the cards unless some treatment has to be carried out. The health visitor will also have to do the minor treatments and keep order generally.

The subject of *record keeping* is very important. Workers training at all health schools in India are now taught to keep records on the card index system. The supreme advantage of the card system is that by it we can follow the development of the individual child, and that is what is essential in child welfare work. Our whole endeavour is to secure regular attendance of infants and children over long periods. It should be realised that this is desirable not only for the sake of the child (so that we can give the right advice at the right time), but it has a wider meaning. We are at present in India very lacking in information on important facts of infant life. To mention only a few, the real causes of high infant mortality, the *average* weights of babies of different Indian races, the time when breast-feeding should be stopped, the diet most suited to toddlers. There are numberless other facts about which we are still ignorant. Health visitors can do a lot to dispel this ignorance by the careful collection of facts. For it is on proved facts that we must take action. Real advance is only possible when we decide to act in a certain way because of what the facts have taught us. Conscientious filling in of cards shows good intelligent work, and is of great value for both the purposes indicated above.

Some committees assert that the card index system is very difficult to manage, because there is so much wastage in cards over cases which fail to continue attending. This is preventable by good follow-up work in the home: it may be a difficulty at first, but with good work it should disappear. The only types of work where such difficulty is real is in industrial work and in the army. In both cases the stay of a family in the place is likely to be for short periods only. On the other hand, really good health work should encourage the stay of families for more prolonged periods.

The actual methods of keeping records are fully learned during the practical training, so are not detailed here.¹

The question of the separation of antenatal and infant clinics is also discussed elsewhere.²

It has been mentioned several times that a health visitor requires to be adaptable. This is nowhere more necessary than in planning out centre work. Different localities have different customs and different needs, and the centre must be made to serve these needs. The type of work seen in most towns of India has a good deal of similarity, but there are at least three varieties of work which need special mention. These are rural work, industrial work, and work in the army.

In all three maternity and child welfare work is urgently required and as yet very little established. The health visitor must not expect to find methods ready designed for her, it will fall to her to find out the best way of carrying on her work. Hence the great need for boldness, initiative and adaptability.

The greatest difficulties in *rural work* are the scattered population, and the lack of means of transport and the need of the people for medical aid. Another difficulty, from the point of view of the worker, is the loneliness and isolation of the life. As yet work in really rural areas has been started in few places, and even these are in the experimental stage. Since the provision of well-trained and comparatively highly-paid health visitors is impracticable for every large village even, we have to think out what we can do with existing help under present circumstances.

¹ Full details are to be found in a pamphlet, entitled *Record Keeping in Connection with Maternity and Child Welfare Work*, obtainable from the Red Cross Depot, Lahore.

² See *Antenatal Work in India*, p. 12.

The village *dai* or *dais* seems to offer the best hope. If a health visitor can make a large village her headquarters, she can get in touch with a number of surrounding villages, instruct the *dais*, supervise the antenatal cases, and gradually start simple clinics for observation of infants and teaching of mothers. By this method the abnormal maternity cases can be discovered and arrangements made for their safe delivery, and much can be taught to village women. It is obvious that this sort of work demands a good deal of self-sacrifice and courage from those undertaking it.

In *industrial work* the health visitor has to contend with a shifting population. The industrial worker in India is, in the majority of cases, a peasant who still has his roots in the village, and returns to it at intervals, either at harvest or sowing seasons or for domestic events. The women folk, even when they accompany their husbands, return even more frequently, for childbirth or other reasons. Another complication is the woman worker. She may work from sheer necessity, e.g. in the case of widows with children, or from the lesser need to supplement the husband's earnings. In both cases she is absent from the home and so can give her children scanty care. Nor can she be easily taught. Wages are usually low and housing poor. This means that the health visitor starts with heavy odds against her. Yet there are few needs more urgent than to provide for careful antenatal work, clean midwifery, and care of small children in industrial areas.

In such work crèches are a necessity and they need careful organisation. Antenatal supervision is made more possible by the maternity benefit system for women workers, which has been introduced by many firms. The development of nursery schools for workers' children is the best means of meeting the needs of children between the crèche and the school-going age.

In both rural and industrial work there is great scope for co-operation with other agencies, and the health visitor should take every opportunity to seek such co-operation. In rural work the educational, health and agricultural departments can all combine for uplift of the people. In industrial areas social service agencies, school and general factory welfare, all touch the health visitor and her work. In both cases the work of co-operative credit societies and banks can do much to give a new outlook, and free both peasant and worker from the clutches of debt.

Army child welfare work occupies a unique position. As yet the number of health visitors in such work is small, but they are increasing and the opportunities are boundless. In the majority of cases the housing in the lines is good, sanitation is enforced, and there is an amount of discipline and order never found in an ordinary bazaar. There is no extreme poverty and the *sepoys* themselves are being educated. In such circumstances the lessons of mothercraft and hygiene can be taught with comparative ease, and such lessons are carried back to the village when the *sepoy* returns to his village on leave or retires from the army. The health visitor here has a field full of hope and promise, and she herself is usually well treated and well housed, and is surrounded by those who are interested in her work and give her full support.

CHAPTER XX

HOME VISITING

THE visiting of mothers and infants in the home is that part of the health visitor's duties which should be the beginning of her activities, and it is the one which should never be left off. It is necessary to labour this point somewhat, on account of the attractions which 'centre' work has for both health visitors and committees. The expression, 'health visitor,' itself indicates the primary object of the work, and shows what the first conception of a health visitor's duties are. Visiting in the homes is still a large part of the duties of a health visitor in England and other Western countries, in spite of the development of centre work. It is obvious that in a country like India centre work can touch but a very small proportion of the people. For various reasons, social and other, it will be many a year before Indian women and children can and will come freely to centres, and even then there will inevitably remain a proportion who do not attend, and among these will be found those who are most in need of the educative influences which a health visitor can impart. Centres are both valuable and necessary, but their desirability should never be allowed to hinder the carrying on of what should be regarded as the first essential. There is in India a tendency to regard the centre as the most necessary part of child welfare work, and in many cases the work is initiated with a centre. The committee likes to have something solid to show; the work is materialised with a centre, which is something definite and objective, members of the committee can visit it and see the work for themselves and feel a pride in it, many activities are possible in a centre where people are collected together which are not possible in dealing with individuals. The health visitor, too, usually prefers centre work. It is less strenuous for one thing. She does not have to tramp through narrow and usually unsavoury lanes, perhaps in hot weather, in search of houses which are hard to find. She does not have to overcome unwillingness, if not actual rebuffs from the objects of her solicitude. In home visiting she is depressed by the home conditions, which

frequently appear to offer insuperable obstacles to the carrying out of her teaching. Yet it is absolutely essential for her to understand the home conditions, and to be aware of the factors which hinder her work, and which sometimes discourage the mothers as much as they do the health visitor. Nothing but home visiting, in addition, can bring her into touch with the women who cannot, or will not, bring their babies to a centre for advice, and who need the help and guidance and teaching which the health visitor can give in the interests of health. Another important point is, that mothers who may be willing to bring their babies later on to a centre are often not willing to bring them when quite young. Thus some weeks, or even months, and these the most important, elapse before the health visitor sees the baby, unless she seeks it out in its own home.

Home visiting must, however, have method at the back of it or else it is not likely to be fruitful in results. The haphazard visiting, which is all that some health visitors try to carry out, or some committees plan, will not achieve much. The visiting must be *systematic*. On what principle then are we to start, what system is to be followed to obtain the best results?

As we have seen, the greatest infant mortality occurs in the first month of life and in the first week of that month. Obviously then it is necessary to concentrate first on infants of this age if our aim is to reduce this mortality. The health visitor must have some means of knowing where births have taken place. She cannot be expected to find out by personal house to house visits. If the work is new, she will not be able to depend on the information supplied by *dais*, and even if it has been well established many births will escape notice. There must be some person or body to supply the details of the births. This person or body should be the civil or medical authority of the place who is responsible for the registration of births. A list of births occurring in her district should be supplied to every health visitor.

As we shall see (Chap. XXII), the lists are often inaccurate and delayed, and this hampers the health visitor's work considerably. However, faulty as the information may be, it is the only source we have, and it must be made use of while every endeavour is made to improve it. The lists should be sent to the health visitor as frequently as possible. Daily lists are, of course, the best, but if

this is not obtainable then weekly or bi-weekly ones are a second best. As the lists are received the health visitor should visit the houses where the births have taken place, and make out a record card for each new baby. These babies must be kept under observation for at least a year. If there is a child welfare centre, and the mother can be induced to bring the baby there, this is all to the good, as it will save the time of the health visitor. If, however, the mother will not, or cannot, attend a centre, then the baby must be kept under observation by home visiting. Sometimes a mother will start attending the centre, and then become irregular in her attendance for one reason or another. The health visitor must not allow the infant to escape observation in this way. If it is not brought to the centre she must visit the home once more. This means constantly looking through the record cards, to see that all babies are attending regularly or seen at home.

It has already been stated that home visiting to be successful must be systematic, and the manner in which the health visitor may start her work has been indicated. The matter, however, does not end there.

We have already said that all infants should be kept under observation for one year. Only in this way can we hope to produce an effect in reduction of infant mortality. In some places the object aimed at is to visit all newly-born babies up to ten days after birth. The idea underlying this scheme is that it is in the first days of life that the infant mortality is greatest. This is doubtless true and to this extent the scheme is justifiable. We must remember, however, that what will secure permanent reduction in infant mortality is the slow process of education of the mothers in all that is summed up in the expression 'mothercraft.' Moreover, antenatal causes are those which account for many of the deaths in the first week or ten days, and postnatal visits can effect but little in combating these. Our opinion is, therefore, that the visiting of a limited number of babies up to one year is likely to be productive of much better results than the attempt to visit a much larger number for ten days only. The baby's feet may be set on the path of health in these ten days, but 355 days are yet left for them to wander from that path, and the likelihood is that they will so wander!

Assuming, therefore, that we are to work on the system of

visiting a number of babies up to one year, how many infants should a health visitor have to superintend? This cannot be determined off-hand, but must depend on (1) the amount of time at the health visitor's disposal for this particular branch of the work and (2) the nature of the place in which she is working.

If the health visitor is spending her whole time in visiting work, she will obviously be able to pay a larger number of visits than if she has to carry on several other activities. Then again, if the area in which she is working is one of congested city streets, the time spent on getting from one place to another is much shorter than it is in the case of a rural area with small scattered villages.

As a working basis we may take the number of visits which experience in England has dictated as suitable for that country. This has been put as 12 for a worker spending her whole time in visiting. If the health visitor's working day is 7 hours, this means that roughly half an hour can be allowed for each visit, including time occupied in getting to the house. If the health visitor is carrying on other work, such as conducting of a centre, classes for *dais* including supervision of *dais'* maternity cases, the number of home visits must be correspondingly reduced, and the number of babies kept under observation in their own homes will be less. If the health visitor succeeds in getting the mothers to bring the babies to a centre, if it exists, then the number of infants can be kept up in this way, but not otherwise.

It may be argued that more time will have to be spent in each house in India than in England, owing to the prevailing ignorance and illiteracy. This may be true, but, on the other hand, this very fact makes it imperative for the health visitor not to try to teach too much at any one visit, as the mother may be incapable of assimilating it. Until we have worked longer in India it is not possible to formulate a standard in this respect, and as a working basis we may continue to adopt that used in England.

Suppose, for the sake of argument, that the health visitor is devoting her whole time to visiting and can pay 15 visits a day. Infants up to three months of age must be visited weekly, after that fortnightly. Infants over six months may be visited monthly, though this interval is certainly too long for those who are at all delicate or sickly. In addition, the period of 8 to 12 months is very

important in teaching the mothers how to get the children on to solid food at this age. At unhealthy times of the year, e.g. in the rains, when children are liable to attacks of diarrhoea, monthly visits are too infrequent.¹ If we take an area in which about 200 births occur annually, we shall find that this is as much as the health visitor can cope with. At the end of the year the health visitor should have 200 babies under observation, less those who have died. Suppose the infant mortality to be 150 per mille, we have to deduct 15 per cent from that 200, i.e. we are left with 170 babies. Of these, one quarter, i.e. 42, will be under three months, and therefore require weekly visits. Allowing six working days in the week, roughly seven visits a day will go to infants. The remaining 128 infants will be visited fortnightly, which works out at $10\frac{2}{3}$ visits a day. The total is 17 or 18 visits daily, a slightly higher number than we have allowed to our health visitor. However, a certain proportion of the families concerned will doubtless have moved to another place in the course of the year, which will reduce the number of visits to be paid. In an area containing both well-to-do and poor, visits to the former may be unnecessary or else unwelcome, and the numbers may be reduced by these means also.

A town where 600 births occur annually would, therefore, require three health visitors for infant visiting. A town of 200,000 inhabitants, taking the average birth-rate as 35 per mille, would have 7,000 births annually, necessitating 35 health visitors.

Those who have not worked out the problem in detail may well be astonished at the numbers of health visitors which are required, and exclaim that at this rate it will be impossible to provide either health visitors or funds sufficient to cope with the situation. This is true, but none the less all experienced in child welfare work are quite convinced that it is better to do a small amount of work thoroughly and scientifically than a larger

¹ In the Annual Sanitary Report of Bombay Presidency for 1925 the Assistant Director of Public Health points out that in Sind the greatest risk to life after the first month is at the third age period, i.e. over six months. This corresponds to the fact observed in child welfare centres, that children who have been healthy up to eight months or so of age then fall off and lose weight. The Director of Public Health remarks that 'no adequate provision is made for these children.' 'Children's hospitals are non-existent and medical men have few opportunities of studying children's diseases. There is thus a lack of skilled *treatment* for older children.' The italics are ours. Surely the Public Health Department should be pressing for preventive work among children, not for treatment. The children depart from health—why let them?

amount superficially. One or two home visits are of no educative value. The health visitor must get to know the mothers thoroughly and so gain their confidence. She must see by her frequent visits that her advice is being put into practice. All this cannot be achieved in a few visits. The process is slow, but it is worth while and must achieve its end ultimately. If a municipality cannot afford health visitors for the whole town, it is far better to concentrate on one ward or division, and do the work thoroughly there, than set one or two health visitors an impossible task, which will only discourage them while achieving nothing.

The health visitor must obviously have a thorough knowledge of the locality in which she is working. A few minutes spent planning her day's visits will be well worth while in the time saved later. A map of the district will be helpful in this particular. At first time will inevitably be spent in searching for houses, but it should not be long before the health visitor is familiar with the streets where she visits. It is almost unnecessary to observe that the health visitor must use the utmost tact and courtesy in her visits. She must not attempt to force her way into a house against the wishes of those living in it, and when she has gained an entry she must do nothing that will disturb the confidence of the people. She should have sufficient acquaintance with the customs, religious and social, of those amongst whom she works, so as to be able to avoid offence against them. Her manner should be bright, friendly and cheerful, not superior or dictatorial, and she should be able to give her advice in such a manner that its acceptance will be easy to the mothers. She should avoid condemning habits and practices outright, but should rather seek to give positive teaching, and that in a homely way that will be readily understood. Any discourtesy or ill-temper will nullify weeks of kind words. The health visitor should not take the infants' cards with her to the houses. She should look through the cards before going to the houses to be visited, and if necessary make a brief note or two in a small notebook. This notebook and a pencil are all that the health visitor should take to the house. After leaving the house, and preferably not in the presence of the people, she may make her notes on the case, and afterwards transfer them to the infant's card when she reaches home. The health visitor should

try, as far as possible, to make her visits at a time when the mothers will be at leisure. She is not likely to gain a hearing if the mother is occupied in preparing the family breakfast, or in some other necessary task.

Under certain circumstances it may be necessary for the health visitor to have a *chaprassi*, an elderly man or woman, to accompany her in her visits, for the first few months at any rate. Such a procedure might be required in a frontier town, for example, or in a place where the work was new and the health visitor might attract attentions of an undesirable kind.

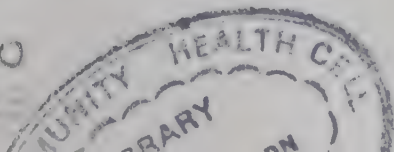
The health visitor should dress simply and quietly, preferably in uniform, or in plain white *saris*.

If a committee has sufficient funds at its disposal, the work of home visiting can be continued among children above the age of one year. This is, of course, what one would like to see. As will be seen elsewhere, the mortality of children from one to six years is much higher than it should be, and constitutes another big problem in child welfare work. Mothers need just as much education in the problems bearing on the life of the 'toddler' as on those of the infant. In the period which elapses before the child goes to school, if he goes at all, he has to learn a great number of things. There is, first and foremost, the problem of diet. This needs a great deal of attention and mothers are exceedingly ignorant on this point. Then there is the problem of infection, for it is in these years that the child usually meets with diseases such as measles, chicken-pox and mumps, as well as with more serious complaints, and also slighter ailments, such as colds and coughs. These take a heavy toll of life—how heavy we do not exactly know, but regular visitation of toddlers would do much to throw light on these problems. Another problem is that of the training of the child, so important at this age and so ill understood by the majority of mothers. The visiting of toddlers could be extraordinarily valuable in these ways. It may be that it is impossible to carry it out at present, but the ideal should always be kept in view. It may be possible, at any rate, to keep those toddlers on the visiting list who live in houses where another infant claims the health visitor's attention. This involves very little extra labour for the health visitor, and is well worth while to the toddler.

Home visits to antenatal cases will also have to be made in

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some cases. The purpose of such visits is to obtain information about the home condition, the social position and means of the family, and other details; also to see that any instructions which have been given at the centre are being carried out, and that adequate preparations are being made for the confinement. These visits need not be lengthy, for it is seldom possible to make satisfactory examinations in the patient's house. They will also frequently coincide with the visits made to infants or toddlers.

CHAPTER XXI

OTHER ACTIVITIES OF A HEALTH VISITOR

IN other countries a health visitor's work embraces many activities which are not as yet common in India. Many health visitors take these up as specialities and devote their whole time to such work; for example, the tuberculosis nurse or the school nurse. In other cases, especially in rural areas, a health visitor gives part of her time to child welfare and antenatal work and part to other duties. In America, public health nurses, as they are called in that country, give a good deal of time to actual nursing in the homes, and child welfare work is less organised.

In India the health visitor has, up to the present time, given all her attention practically to infants, toddlers and antenatal work. The only other activity to which she has devoted time is the training of indigenous midwives or *dais*. It is probable that in the future this state of affairs will alter, and already there are signs that workers will be in request for other forms of public health work. Certain of the activities which we propose to notice here are of a kind which the worker herself could initiate and carry on with her other work. The wider the view she can take of her profession the better. She should not, of course, dissipate her energies. And it is better to do a few things well than a number badly. But in concentrating on antenatal, infant and child care, the health visitor is apt to lose sight of the fact that health work must embrace not merely a part of the life of an individual, but his whole life, that of his family and that of the community. Much health work in India suffers because this principle is forgotten. It is true that the health visitor cannot make her influence felt in all these spheres. But she must make the attempt to link up her particular duties with other influences that are brought to bear on the individual, his family and his community. This is not at all easy, since charitable work is poorly organised as yet and the duty of the State to its citizens is not nearly so clearly defined in this country as in the West. In many countries there are agencies for help which are non-existent in India, and which the health

visitor finds of great assistance to her. For example, in England, if the father of a family is out of work, he can receive unemployment insurance to enable him to support his family. Children can be given free meals at school. There are numerous charities which can give help and assistance to those in need. The absence of such provision in India sometimes makes the health visitor's work very disheartening. But she should keep herself well informed of any possible sources of help, and she should be in the closest possible touch with all local hospitals, with the medical officer of health, with schools, and with branches of any existing society, such as the Red Cross Society, the Seva Samiti, rural uplift work, etc., etc.

A few notes are given here on some of the principal subsidiary activities which are, or can be, undertaken by health visitors.

1. THE TRAINING OF INDIGENOUS DAIS

This is a piece of work which is of great importance in most parts of India. The training is in itself a real necessity, but in addition the health visitor, for her own sake, will find it essential to make an ally of the indigenous *dai*. As a rule she will constantly be meeting the *dai*, or traces of her, in her daily work. The *dai* can be a good friend but a bad enemy. It has to be remembered that the *dai* frequently occupies the position of family adviser and confidant. It is she who is consulted first when there is a doubt about pregnancy, or a gynecological complaint. It is she who brings the infant into the world and cares for it in the first important days of its life. She has all the prestige which age and experience give, and custom has given her position a dignity which her own knowledge is far from deserving.

The difficulty of starting a class for *dais* is not nearly so great as it was twenty or thirty years ago. The *dais* have begun to prize training, and are, in towns at least, eager for 'certificates.' A small sum of money is required to carry on the class, since *dais* must still be paid to induce them to acquire knowledge. They must also be paid for allowing the health visitor to supervise their cases, i.e. for calling her to be present at the time of birth. A good plan is to give the *dai* a small sum for each case shown in the antenatal state. This has the double advantage of putting the health visitor in touch with the antenatal cases and giving her an opportunity of teaching the *dais* on live cases.

The organising of *dais*' classes and the methods of carrying them on differ from place to place, and the work must be learned by practical experience. Moreover, some have a gift for such work which others lack. We cannot enter into details here, but the following hints may be found useful:

1. Have small classes, twelve is the outside number which can be taught with profit.

2. Choose the younger, more intelligent *dais*; the old, blind and deaf will not make bright pupils.

3. Make the lessons practical. Get the *dais* to discuss their cases and difficulties, and so make that the basis for a lesson. Provide models.

4. Know your own work well, or the *dais* will not respect you.

5. Know also your limitations. Make clear to the *dais* when a doctor is necessary.

6. Treat the *dai* with courtesy, especially in front of the patient.

7. Keep a watchful eye on passed out *dais* and their outfits!

Work among *dais* is undoubtedly very toilsome, and requires a great deal of perseverance, tact and good humour. But it is an activity which few centres can afford to be without.

2. EDUCATIONAL WORK

All the efforts of a health visitor should in reality have an educational aim. She is all the time teaching that fundamental lesson—mothercraft. But what we are considering here is something a little more defined in its aim, that is, definite classes for mothers. Subjects which can profitably be taught in connection with welfare centres are the following: Sewing, cooking, home-nursing, first aid, simple hygiene and mothercraft itself in a more systematic form. Such classes should best be held among middle class women. The very poor and ignorant are scarcely able to follow class teaching, but need individual attention. They can seldom give the time also, unless to sewing classes, where there is something tangible to gain. The health visitor can organise such classes among suitable mothers attending the centre, but preferably not at times when the centre work is going on. She may also hold them in connection with ladies' clubs, or at schools. Such classes should be small in numbers

and as practical as possible. Never attempt too much in any one lesson, make a few points and make them well. Relate everything up to the daily lives of the members of the class. Suitable books are available as a basis for some of these classes, but the health visitor should not follow them slavishly, but adapt them freely. The sewing or knitting class should, of course, be almost entirely practical. In the case of the very poor material is often provided which the mothers make up into garments and then keep. This is infinitely preferable to the giving away of ready-made garments. Better class mothers should pay for the materials or bring their own. They need instruction on sensible suitable *materials* for garments as well as on their making. If any 'talk' be attempted at a sewing class it should be about clothes, their kinds and uses and the principles involved. Classes for fancy work sewing do not come within the scope of the welfare centre, though mothers can be shown how to make simple garments attractive by stitchery.

If 'health talks' are given, either to a group of mothers while attending the centre or at a separate time, these, too, should be as simple and practical as possible. Make the talk appropriate to the time of year, the epidemic prevailing or any incident occurring at the centre.

3. TUBERCULOSIS WORK

In the large cities of India much interest has been roused in the problem of the spread of tuberculosis, and attempts are being made to combat both the disease and its spread. The health visitor can assist this work in her ordinary home visiting, but some of the associations which have been formed to check the ravages of tuberculosis wish to employ whole- or part-time workers for tuberculosis work in particular. A health visitor taking up such work should have some special training in such work, if possible. It usually consists in a combination of clinic work, at an anti-tuberculosis dispensary, with a doctor in charge, and 'follow-up' work in the homes of the people. Much good can be achieved by the teaching of health habits and the instruction of infectious patients as to the means to be taken to avoid the spread of the disease to other persons. But bad general hygiene, overcrowding and bad housing, as well as evil customs, such as the *purdah* system, undoubtedly make the work very difficult.

4. VENEREAL DISEASES WORK

The health visitor can be of great assistance in any efforts directed against venereal diseases. The actual conduct of the work is, of course, in the hands of a medical man or woman. In the case of the treatment for syphilis, the course of treatment is a very long one, and the great majority of patients tend to leave off attending a clinic when the immediate symptoms disappear and long before a cure has been effected. Few branches of medicine offer a better example of the combination of prevention and cure than syphilis. The cure of an individual is undertaken not only for her own sake, but in order that she may be prevented from infecting other people. The kind of cases which the health visitor is most likely to see are those in expectant mothers and in children who are the victims of congenital syphilis. There are also the cases of what may be called the 'potentially' expectant mother. If antenatal work is vigorously carried on, it is usual to find that women come to the clinic who are not pregnant, but who wish to become so. Among such some will be found to be suffering from syphilis. The doctor of the centre must, of course, decide whether such patients are to be treated or not. Antenatal cases should, if possible, always be treated. The health visitor's task is to see that the patient persists with the treatment until such time as she is pronounced to be cured. It needs much tact to explain to the patient the need for continued treatment and the danger of incomplete cure. The objections to treatment by injections and removal of blood for examination must be overcome with patience.

In the case of babies infected with congenital syphilis the position is similar. It is very hard to make a mother persist with treatment when the baby is apparently healthy. When inunction with mercury ointment is prescribed, as is frequently the case, advantage may be taken of the fact that rubbing and massage are both popular among mothers for their babies.

5. SCHOOL MEDICAL INSPECTION

This work is not as yet very extensive in India, and where it has been begun health visitors have scarcely been employed. Yet this is an activity in which there is ample scope for the health visitor. She has also a direct interest in it, for in the

schools she may meet again the children who were once under her care as infants and toddlers.

At present the work of medical inspection of school children is practically limited to the examination of the children by a doctor. Very often he, or she, does not meet the parent of the child, and so has no opportunity to press for necessary treatment or for better health habits. It is the health visitor who should do the 'follow-up' work which is so necessary; 'persuade recalcitrant parents to secure treatment, overcome prejudice and superstition, and do propaganda work on home and personal hygiene.'¹ In addition, the health visitor could do a good deal of what is at present entrusted to a doctor, viz. the routine, usually quarterly, visits of inspection for cleanliness and minor ailments, the weighing and measuring of the children. She could also do useful work in health teaching in schools and in giving elder girls lessons in simple home nursing and mothercraft. In every small place the health visitor should make a point of getting into touch with the schools and teachers. Even if there is no medical school inspection in which she can help, she can offer her services for health talks.

The girls who are in school today are the mothers of tomorrow. If their interest can be secured while their minds are receptive to ideas, and before they are in the iron grip of custom, they can be taught a great deal which will be of value to them in married life.

6. PROPAGANDA WORK

Just as every health visitor is an *educator*, so also is she a *propagandist*. A dictionary definition of propagate is 'to multiply or reproduce by sowing.' The propagandist is the one who does this. What the health worker does is to sow *ideas*—ideas about health—and sow them in the minds of those she comes across. She must do this constantly, because much of the seed she sows falls on stony, unproductive soil, so that the seeds never germinate. In her daily work, whether at the centre or in the homes, she is always doing propaganda work.

But in addition to this she may also undertake propaganda work at special times or on special occasions, and the propaganda may be planned to attack a special disease or a special custom

¹ Dr. J. M. Orkney, *Red Cross Journal*, April, 1932.

which is evil from the health point of view. For example, if there is an epidemic of smallpox the health visitor may do propaganda work on this subject. This will naturally consist in enlightening people as to the nature of the disease, how it spreads and how attacks may be prevented. Lectures may be given and a vaccination campaign may be begun.

For propaganda work a lantern is very useful. Illiterate people can be taught by means of pictures when they are not willing to listen to lectures alone. Posters can also be used, but for smaller audiences. For good propaganda work the health visitor must have her subject at her finger tips, and her audience well in hand. This means self-confidence, ability to put things in short fitting sentences, a good voice and an arresting manner. All are not born with such gifts, but all can to some extent cultivate them. The subject for propaganda should be either something which is engaging the attention of the public in any case, as, for example, an infectious disease, or, if it is a subject upon which it is desired to focus the attention of the public, it should be related up to something which is vital to their lives. There is no point in lecturing on plague when no plague exists within a few hundred miles. And when doing propaganda on flies, bad sanitation, or other subjects on which people display complete apathy it is necessary to start off from something which will at the beginning arrest the attention of the audience.

Propaganda work often takes the special form of a Baby or Health Week. For such celebrations the help of a health visitor will always be in demand, and she should give it as generously as possible. It is not possible to enter into details as to the methods of celebrating such 'weeks' here, but the health visitor should always try to secure some permanent result from a baby week, for her own work or for the cause of health in the town as a whole. Baby 'shows' must be very carefully organised, otherwise more harm than good may result.

Occasional lantern, or, where available, cinema shows are a great treat to mothers attending a centre, if circumstances allow it. These should be carefully organised and restricted to those for whom they are meant. When school boys hear of a cinema they tend to swoop down and occupy all the available space.

A special treat is often held at Christmas. This does not

presuppose any religious motive, but simply that it is generally known to be a 'festive' season. At the time of the ordinary Hindu and Muslim festivals the women are occupied in their own homes. There is no harm in a yearly 'treat.' Presents are often given to the children and mothers, but it must be confessed that these are often the cause of ill-feeling and jealousy. A treat can, however, be held without presents; some *tamasha*, such as music, dancing, a juggler or a cinema may be arranged, and sweets, tea, cold drinks and fruit may be given.

7. MILK DISTRIBUTION

It may be thought strange that the provision of milk is considered among 'other activities' and not as a part of centre work. This has been done on purpose, because though the distribution of milk *may* be, and often is, a centre activity, it should never be regarded as an essential one. Many centres are carried on without any milk distribution whatever, and many more fail to be true centres just because milk has come to occupy such a prominent place in the work. The health visitor or her committee may regard milk distribution as only *one* feature of the centre, but there is no doubt whatever that whenever milk is given in any considerable amount at a centre, those attending regard milk as *the* essential feature.

The giving of milk is, of course, an immediate attraction, and will make a centre popular. It will also no doubt confer an immediate benefit on the recipients of the milk. There are many cases who attend welfare centres to whom the worker longs to give milk, the expectant or nursing mother whose diet is deficient in quantity or quality, the toddler who is not being given the easily assimilable protein he needs. But the health visitor has to pause and consider not merely the immediate benefit to a few individuals, but the ultimate benefit of the community and the real object of a welfare scheme. This is taking what is called the 'long view,' and it is a very difficult process. The committee which the worker is serving does not usually find it any easier than the worker herself to take this 'long view.' The object of a centre, as has been already stated many times, is educational, and milk distribution does very little to further this aim. A certain proportion of those commonly in receipt of milk *could* be given milk by the parents, and the fact

that it is supplied by the centre is a discouragement rather than an encouragement to the parents to plan their expenditure so as to secure milk for their children. The others, who are more numerous, are those whose parents cannot afford such expenditure, but in giving them milk we are not teaching the parents anything except possibly dependence on charity, which is not at all desirable. We have to remember also that milk is very expensive, and if much milk is given away money is spent which would really give a better return in other ways. If milk is a prominent feature in centre work, a class of people is attracted to the centre who come for material benefits and not because they wish to see their children kept in health. This class of people is one which, through ignorance and poverty, is not very teachable. The crowding of a centre with such a class tends to exclude those who do not wish for such aid in the shape of milk, but who could benefit by teaching.

If it is decided that milk shall be one of the activities of the centre, the following are some of the points to be observed to secure that the best use is made of the milk given:

1. Very careful selection should be made of the cases to be helped. Preference should be given to expectant or nursing mothers and toddlers. In the latter case give the milk with some cereal, which makes it go further and gives the child extra calories in the form of starch. A good idea is to have a 'milk list,' on which is stated the reason why the child (or mother) is placed on the list. Always make clear to the mother why she or the child is given milk.

2. See that the milk supplied is of good quality and clean. See that it is not tampered with by the menial staff in the process of collecting, boiling or distributing.

3. Insist on milk being drunk at the centre. It should never be taken home.

4. Try to secure some payment from the parent. Even a few annas a month will make the parents value the help given more, and prevent a demoralising effect on the character. Parents may be asked to provide the cereal cooked with the milk.

5. In the case of toddlers, weigh the child at frequent intervals.

The conclusion of this chapter seems a suitable place in

which to mention the help of voluntary workers, without whose help it will be very difficult for health visitors to carry on all their work and take part also in the activities mentioned. For a health visitor to manage single-handed at a centre is almost impossible, without scamping the work or making the mothers wait unduly. The number of voluntary helpers available in most centres in India is unfortunately very limited, and the number who are willing to be regular in such work as they do undertake is still smaller. It is to be hoped that, with the advance of women's education and a deepening sense of civic and social responsibility, the numbers will increase. Every attempt should at least be made to secure such helpers. The experience of other countries has shown how valuable they can be, not merely on account of the actual work done, but through the spirit they bring.

The health visitor has often to display a certain amount of tact in accepting the help of voluntary workers. These may have their own ideas as to how the work should be carried on, which may not be those which the health visitor has learned during her training. Such situations require careful handling. The health visitor has, of course, superior technical knowledge, but she may not have the local knowledge of people and conditions which the voluntary worker possesses. Good sense and good humour on both sides should be sufficient to overcome such difficulties. Health visitors should ever remember that voluntary workers bring interest, support and often money to the centres, and it is most essential to secure these for the work.

CHAPTER XXII

VITAL STATISTICS

THE study of vital statistics is a difficult and complicated matter which cannot be attempted by most health visitors. Certain aspects, however, must be studied by any workers who are attempting to improve the health of the community in which they live, and we shall try to put these in a simple form.

What are vital statistics and why do we attach importance to them? Vital statistics has been defined as 'the science of numbers applied to the life-history of communities and nations.' This may sound rather difficult, but it is not really so. It means simply that we use numbers in finding out various facts about people. An illustration will make this clear. Supposing we wish to find out whether smallpox is common in a certain town, what we do is to find out first how many people are living in the town, i.e. the *population* of the town, and then how many cases of smallpox have occurred during a certain period of time, usually one year. We then have two sets of figures, and they will give us the information we require. Vital statistics are, of course, capable of being applied to a great number of facts about different sets of people, and different aspects of their lives. We may, for example, wish to find out the numbers of people engaged in different occupations in a certain area. The area may be a province, a district, a town or a village. In any case we should have to ascertain the total population of the area, and the number of people in each occupation. We should then be in a position to compare the numbers employed as clerks, teachers, doctors, shopkeepers, labourers, and so on. This is what is actually done at the time of taking the census. A census is a numbering (or enumeration) of the people of a whole country, which takes place every ten years. The opportunity is taken not merely to find out the total population, but a great variety of other facts, such as the proportion of the two sexes, the numbers in different age groups, the occupations of the people, and so on. In order to make ready comparison between one place and another we reduce the figures obtained to a common deno-

minator. For instance, suppose that we ascertain that in one town, which we will call X, there are 97 deaths from cholera in a year, and in another town, called Y, there are 145 deaths. There are obviously more deaths from cholera in Y than in X. But unless we know the population of X and Y we cannot tell in which town a larger number of people, *in relation to the population*, died of cholera. Now if the population of X is 9,504 persons and the population of Y is 26,709 persons, it is clear that the *proportion* of people who have died in X is greater than in Y. If we had always to keep both figures of the total population of a place and the deaths from a particular disease in mind, in comparing it with another place, it would be a very slow and clumsy method. What is done, therefore, is to reckon the deaths in terms of thousands of the population. In the above case the *death-rate* from cholera in town X is $\frac{97 \times 1,000}{9,504} = 10.2$ per thousand, and the death-rate in town Y is $\frac{145 \times 1,000}{26,709} = 5.4$ per thousand. We are thus able to see at a glance that the death-rate, or rate of *mortality*, from cholera is much higher in town X than in town Y. In comparing a large number of facts it is essential to reduce them in this way to rates which can be easily compared.

The vital statistics which it is most important for health visitors to know about are: death-rate, birth-rate, infant mortality rate and maternal mortality rate.

It will be helpful to her also to know something of the death-rates from various diseases. Every health visitor should possess the report of the Director of Public Health of the province in which she is working, and workers in the big municipalities will also be able to see copies of the reports of their medical officer of health. These reports contain a great deal of valuable and interesting information which health visitors should take pains to study.

Before explaining in detail the vital statistics with which health visitors should be specially familiar, we must answer the second part of the question given above, namely, Why do we attach importance to vital statistics? Every health visitor knows that the object of her work is to improve the health of those under her care and to prevent unnecessary deaths. Now when we set out to do any work we must have a certain amount

of information at our disposal to enable us to do the work in the most effective manner.

For example, suppose a tailor wants to make a coat for a man, he measures the man's height, chest girth, the length of his arms, etc. He does this in order to know how much material he needs to make the coat and how he should shape it. In the same way, if we wish to improve health and prevent death and disease, we must know the causes of death and disease, at what age most people die and other facts, before we can plan our work to the best advantage. No good work can be done until we find out along what lines we should proceed. This is why the collection of information, such as vital statistics represent, is so important. It is of special importance in a country like India, where there is a great deal of disease, the death-rate is high and the knowledge of hygiene very scanty. In addition, India is not at present a wealthy country. The amount of money available for medical and sanitary schemes is very limited, and even more the amount for maternity and child welfare schemes. For this reason alone it is imperative to have exact information, so that we may plan schemes on the most profitable and economical lines. An illustration will make this clear. Suppose we wish to open health centres in a certain place and provide sufficient trained midwives to attend all the confinements in the town. If we do not know the population of the place, nor the number of births taking place yearly, how can we calculate the number of health centres necessary or the number of midwives which we shall have to train? Or suppose we wish to vaccinate a number of babies, we must know *how* many in order to get the right amount of lymph. A great deal of money is wasted just because we have not sufficiently precise information as to what problem it is most important to attack, or what amount of money is required for certain objects. Precise information will help us to set our aims clearly before us and plan our expenditure wisely.

Of course, it must not be thought that the collection of all facts is at all an easy matter, or that we can always make the correct deductions from known facts at once. In some problems there are many factors at work, and it may take years of work to decide which is the most important. Take, for example, the question of infant mortality, or death-rate of children under one year of age. From the statistics already available we know that

the infant mortality in India is very high. In order to reduce it we must find out the causes of this high mortality. A moment's thought shows us that this is a very complicated problem. In the first place we have to find the actual cause of death, and in the second we have to study the causes in the environment which lead to children dying of particular diseases. These are many and various. Suppose we find that a large number of children die of gastro-intestinal troubles. We have then to investigate the reasons for the prevalence of these troubles. A few of them are: atmospheric conditions, such as great heat and humidity; improper and irregular feeding; infections; dirty milk. It obviously requires a great deal of careful investigation before we can decide the order of importance of these causes, and therefore which should be the first to be attacked in any health measure.

This instance has been taken because it is a subject closely bound up with the work of health visitors. The reduction of infant mortality is one of the first objects of the health visitor's work. It is urgent to get more precise information as to its causes, and health visitors can make an important contribution to this work by careful observations, collection of facts and presentation of them in a systematic form. This will be referred to again later.

It was stated above that there were certain vital statistics with which it was necessary for health visitors to be familiar. We must now turn to these.

THE BIRTH-RATE

The birth-rate is the number of births occurring in any area per thousand of the population. We can express the birth-rate as an equation thus:

$$\text{Birth-rate} = \frac{\text{No. of births} \times 1,000}{\text{Population}}$$

If in a certain town the population is 50,000 and there are 1,500 births in one year, then the birth-rate is $\frac{1,500 \times 1,000}{50,000} = 30$ per thousand.

Conversely, if we know the birth-rate and the population we can find out the number of births that have occurred. Number of births = $\frac{\text{Birth-rate} \times \text{Population}}{1,000}$

The birth-rate for British India in the year 1929 was 35·5. The birth-rate for England and Wales in 1929 was 16·3.

THE DEATH-RATE

The death-rate is the number of deaths occurring in any area per thousand of the population. It may be expressed as an equation thus:

$$\text{Death-rate} = \frac{\text{No. of deaths} \times 1,000}{\text{Population}}$$

If in a certain town the population is 60,000 and 1,200 persons die in one year, then the death-rate is $\frac{1,200 \times 1,000}{60,000} = 20$ per thousand.

In the same way, if we know the death-rate and the population we can find out the number of deaths which have occurred.

$$\text{No. of deaths} = \frac{\text{Death-rate} \times \text{Population}}{1,000}$$

The death-rate for British India in 1929 was 25·95 and for England and Wales 13·4.

THE INFANT MORTALITY RATE

The infant mortality rate is calculated in a somewhat different manner. It is the number of deaths of children under one year of age per 1,000 births per annum. It is calculated in this way because the number of children born is known on account of registration, whereas the population under one year of age is not known accurately. It can be expressed as an equation thus:

$\frac{\text{No. of deaths} \times 1,000}{\text{No. of births}}$ Thus, if in a certain area the number of births was 2,000 and the number of deaths of infants under one year of age was 400, then the infant mortality rate is $\frac{400 \times 1,000}{2,000} = 200$ per thousand.

The infant mortality rate in British India in 1929 was 178. In England and Wales it was 74 in 1929, 60 in 1930, and 66 in 1931.

THE MATERNAL MORTALITY RATE

The maternal mortality rate is the number of deaths of mothers occurring in connection with child-birth per 1,000 live births per annum. It can be expressed as an equation thus:

$$\text{Maternal mortality rate} = \frac{\text{No. of deaths} \times 1,000}{\text{No. of births.}}$$

If there are 24 deaths of mothers in 2,000 births, then the maternal mortality rate is $\frac{24 \times 1,000}{2,000} = 12$ per 1,000.

The maternal mortality rate is not exactly known throughout the greater part of India, for reasons which we shall explain presently. The rates for Bombay, Calcutta and Madras are 8·13, 6·9 and 13·1. In rural areas the rates are much higher. The rate for England and Wales in 1929 was 4·33.

It will be noticed that the birth-rate and death-rate for India are a good deal higher than for England and Wales. In the latter country both rates have fallen considerably, as the following table will show:

Period	Average annual birth-rate per 1,000 living India	Average annual birth-rate per 1,000 living England	Average annual death-rate per 1,000 India	Average annual death-rate per 1,000 England
1871-1880 ...	Not available	35·4	20·00	21·4
1881-1890 ...	24·00	32·4	26·00	19·1
1891-1900 ...	34·00	29·9	31·00	18·2
1901-1910 ...	38·00	27·2	34·00	15·4
1911-1920 ...	37·00	21·8	34·00	14·3
1921-1930	34·54	18·3	26·00	12·1

In India the rates have not shown such a tendency. The infant mortality rate in England has steadily declined since the beginning of this century. This has been ascribed to various causes. Better educated mothers mean that more intelligent care is given to infants. Improvement in general hygiene reacts on infant as well as adult life. Part of the decrease is, however, generally admitted to be due to the child welfare movement, which has made skilled care and advice available to mothers and infants. Some authorities are of opinion that the introduction of dried milks has had an effect on the infant mortality rate.

The infant mortality rate in India is still very high and it shows little tendency to decline. The infant mortality rate of a country has been described as 'the most sensitive index of its sanitary progress.' The general backwardness in hygiene undoubtedly accounts for many infants' deaths. Other causes of the high infant mortality are ignorance, superstition, early marriage, the *purdah* system, bad housing, overcrowding and

poverty. Health visitors should think out for themselves the way in which these various factors operate to bring about infant deaths. They should also reflect on the ways in which their own work can help to combat the causes. Child welfare work will undoubtedly help to bring down the rate, but as yet it is too imperfectly developed and not widespread enough to have much influence.

Year	Infant Mortality rate per 1,000 live births		Year	Infant Mortality rate per 1,000 live births		Year	Infant Mortality rate per 1,000 live births	
	India	England and Wales		India	England and Wales		India	England and Wales
1912	207·65	95	1919	224·40	89	1926	189·04	70
1913	194·61	108	1920	194·93	80	1927	166·93	70
1914	211·83	105	1921	197·90	83	1928	172·94	65
1915	201·90	110	1922	175·09	77	1929	178·39	74
1916	202·34	91	1923	175·66	69	1930	180·83	60
1917	205·18	96	1924	188·66	75			
1918	266·96	97	1925	174·40	75			

Health visitors should be able to use the facts given above intelligently in their work. It has already been said that a health visitor's work is to improve the health of those under her care and prevent unnecessary illness and death. Very few workers at present take the trouble to prove, either to themselves or to the public, that they are achieving this object, yet in many cases they could prove the effects of their efforts in figures. At the end of every year a health visitor should work out the death-rate of infants and toddlers under her care. She can then compare her figures with those of the whole town or of other areas of the town. She can also work out the maternal mortality rate among her antenatal cases. In addition, she should make an attempt to assess the causes of death, the months in which the death-rate is highest, and the age period at which the infants die. Such data, if collected over a number of years, will lead to a series of very interesting observations, and might be of value to the public health authorities.

On pp. 168 and 169 statements of facts in the form of 'tables' are shown. By such tables we are able to see a number of facts or observations clearly and we are also able to make comparison easily between two sets of facts or observations which have been

recorded in numbers. Another method is used which enables us to see such facts even more clearly. This is the method of making diagrams or *graphs*. The health visitor is already familiar with two kinds of graphs, namely, the temperature chart and the weight chart. In both these cases the graph or chart consists of a rectangle ruled in squares. Measuring from the bottom left hand corner we make a horizontal line to the right and a vertical line upwards, mark these two lines in equal divisions, and rule them across and up the paper. Squares are thus formed, and each square represents a unit in time and value. In the case of the temperature chart the time (in this case measured in hours or days) is placed on the horizontal or base line; the temperature in degrees is measured on the vertical or upright line. In the case of a weight chart the time, this time measured in weeks, is on the base line, and the weight, in pounds and ounces, on the upright line.

When we make an observation we first find the correct place on each line, i.e. the line for the time and that for the temperature or weight, we then follow the lines up and along until they coincide, when a mark is made on the chart. The next observation is made in a corresponding manner, and the two are joined by a line. This process is called 'plotting.' If we make observations over a considerable time, as in the case of a long illness, or a baby attending a centre regularly for weighing, we get a *graph* of the temperature or weight. In other words, we have 'plotted a curve' of the temperature or weight. It can easily be seen that a general impression is quickly conveyed to the eye and the mind by this means. We observe quickly the rise and fall of the temperature and the rise or fall of the infant's weight.

This method is applied to observations of vital statistics. Take, for example, the observations on population. If a graph is made of the population of a country or town over a number of years it is easy to see at a glance whether the population is increasing, decreasing or stationary (Fig. 3). The same holds good with birth- or death-rates (Figs. 1 and 2), and rates due to diseases of various kinds. Many such graphs are very instructive, and they are very useful for propaganda purposes.

In making a graph there are a few fundamental rules to be adhered to. The paper usually used for making graphs is divided into squares, ten of which measure one inch. The scale

used depends on the kind of observation we wish to make. In the case of a temperature chart, as we have seen, each division on the base line represents a part of a day. In the case of the weight chart each division represents a week. Supposing we wished to make a graph of the seasonal incidence of a disease like small-pox or measles, each division would probably represent one month.

In the case of annual birth- or death-rates each division would represent a year. In the case of populations as measured by the census which is taken once in ten years, each division might represent ten years. Thus it will be seen that the scale is adjusted in accordance with the observation which has to be made. It would be impossible to use a scale of one division to a year for a weight chart, just as it would be impossible to use a scale divided into months for a graph of population which might extend over 100 years.

With regard to the uprights of a graph we have again to consider what scale will be suitable. This depends on the size of the numbers concerned. In the case of populations which would run into millions, each division would represent one million, ten millions, or even a hundred millions. In the case of birth- and death-rates which are measured per 1,000 of the population, each division would represent a unit. A glance at the accompanying graphs will make this clear (Figs. 1, 2, 3).

The second important point to remember in making graphs

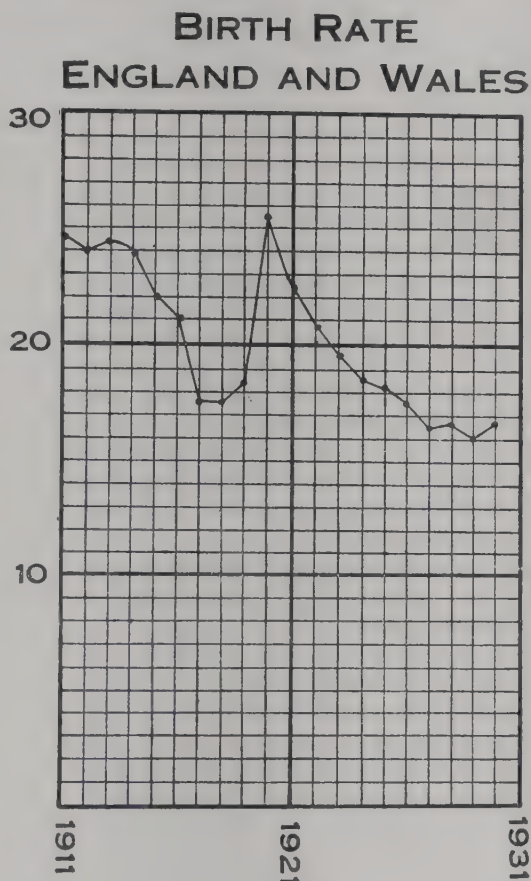


FIG. 1

is that the vertical scale must begin at 0 even if the smallest observation made is considerably large than 0. This means that the curve may start some way up the graph, but that does not matter (Figs. 1, 2, 3, 4).

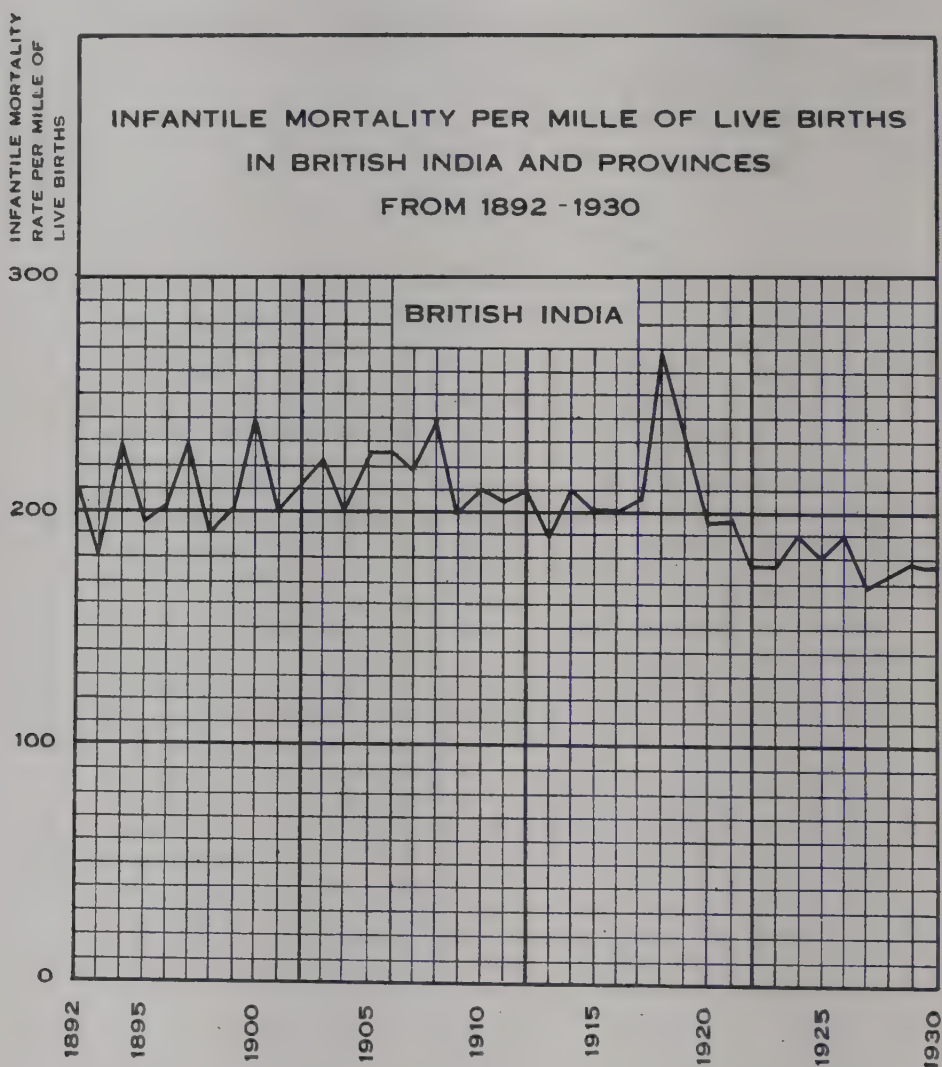


FIG. 2

In making a graph always put a heading explaining what the graph represents. This should be short and concise.

For purposes of comparison it is not necessary to draw two separate graphs to represent two sets of facts. We can put both the curves on the one graph. If this is done they must be distinguished either by colours or by making one line plain and one dotted (Fig. 4).

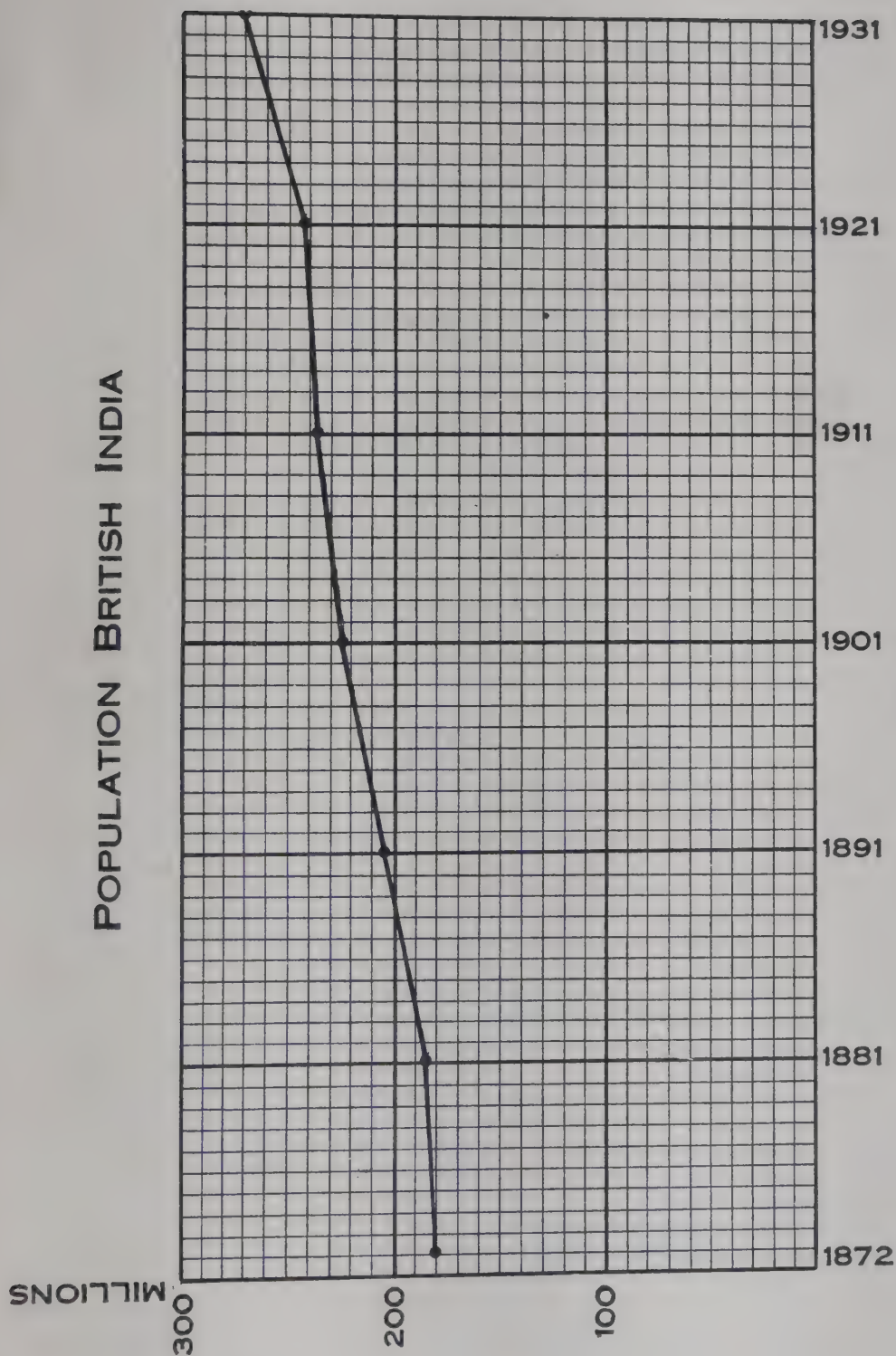


FIG. 3

Other kinds of graphs are the 'bar' diagram and the column diagram (or 'histogram'). These are mentioned here because they are very useful for propaganda work. The bar diagram is used for purposes of comparison or 'relative importance.' The

MEAN MONTHLY DEATHS FROM DIARRHOEA AND
DYSENTERY IN 1926-30

MONTHLY DEATHS IN 1931

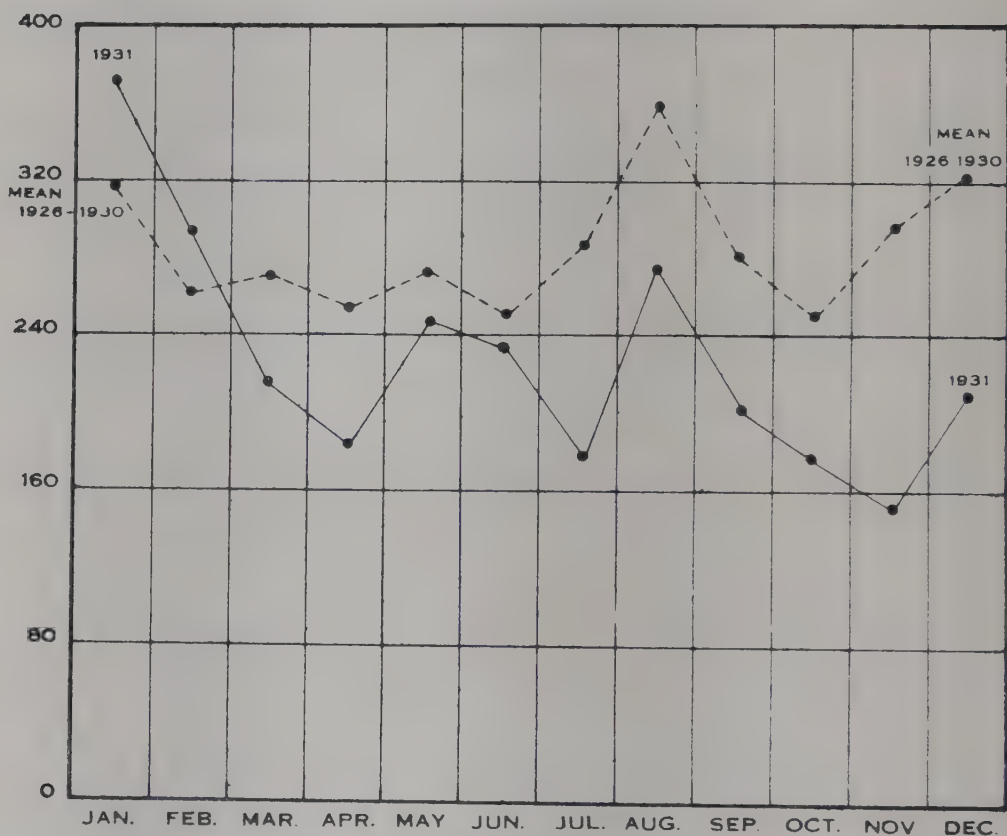


FIG. 4

scale in this case is only on the base line. For example, in comparing deaths from different causes or deaths from the same cause in different years, the numbers or rates are written on the base line and the bars are drawn horizontally one above the other (Fig. 5).

The column diagram or 'histogram' is chiefly used to show 'frequency.' For example, we want to show at which age period

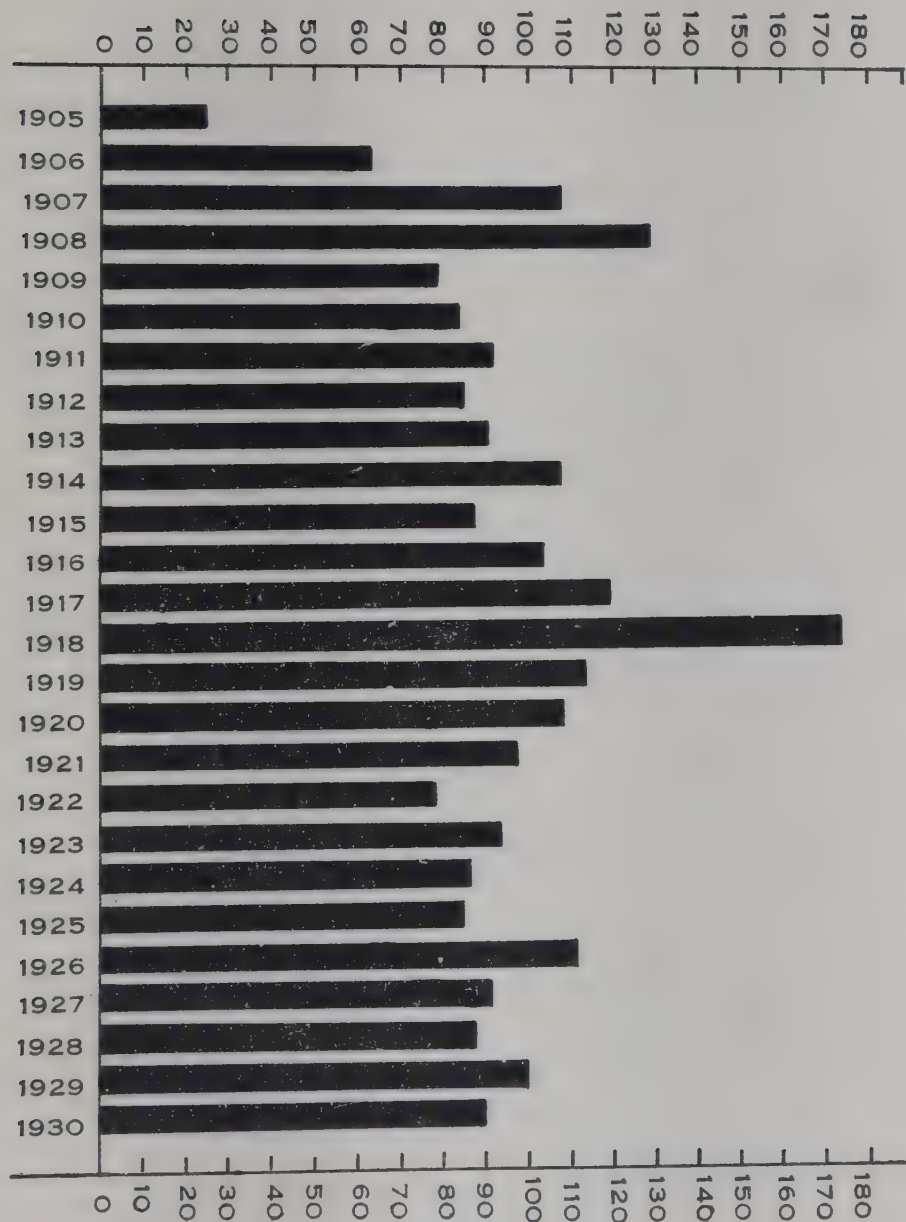
DEATHS FROM RESPIRATORY
DISEASES, DELHI

FIG. 5

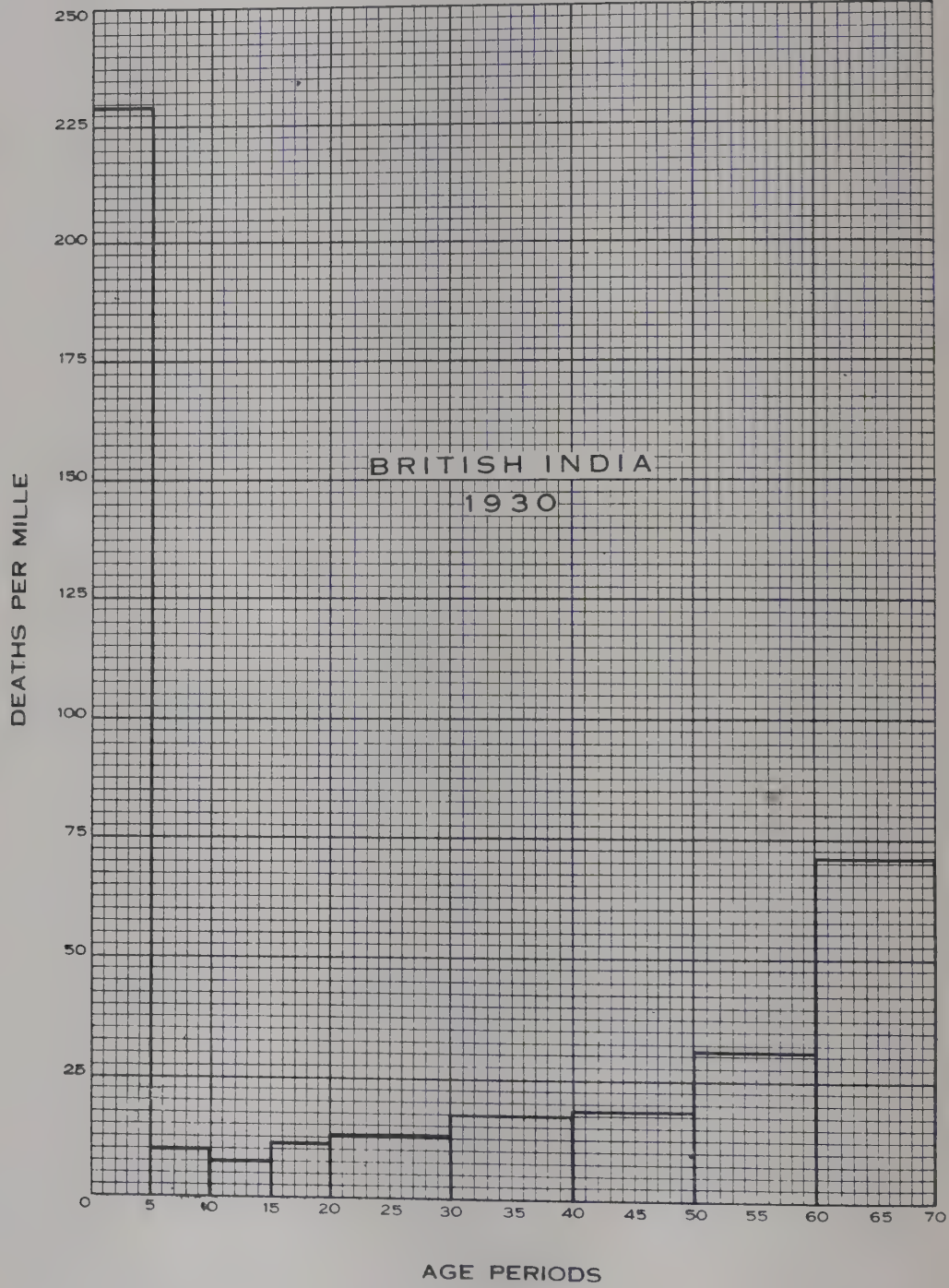
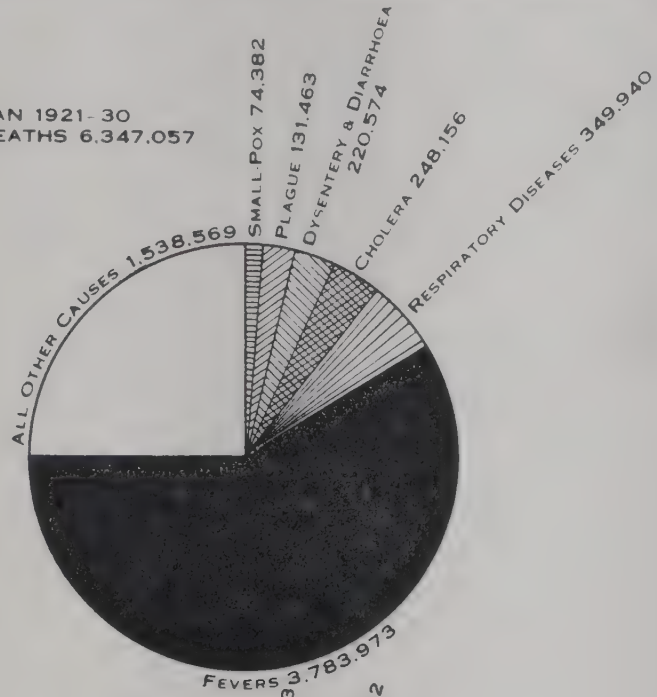


FIG. 6

BRITISH INDIA
COMPARATIVE DIAGRAMS OF DEATHS BY CAUSES

MEAN 1921-30
TOTAL DEATHS 6,347,057



YEAR 1930
TOTAL DEATHS 6,483,449

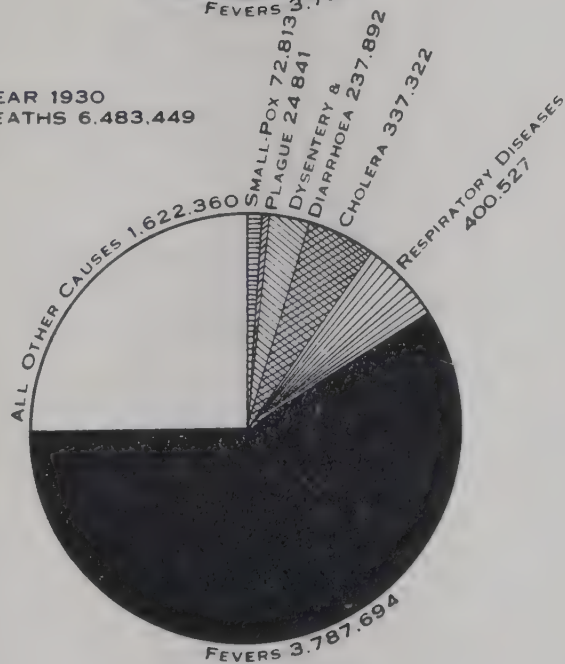


FIG. 7

the death-rate is highest or at which age a particular disease is most frequent. To do this we place the age periods along the base line, 0-5, 5-10, 10-15, etc. The numbers of deaths are placed on the vertical line (Fig. 6).

Still another method which can be employed is that of a circle divided into segments. An illustration of this is shown in Fig. 7. (Incidentally this particular diagram illustrates well the lack of accurate registration of causes of death mentioned on p. 181.)

The health visitor may ask, of what use is this knowledge to her, and how can she use it?

In the first place she can make graphs of her own work. We said that reduction of infant mortality is one of the health visitor's most important tasks, and that every health visitor should calculate the infant mortality among the babies under her charge. If she does the latter, and makes a graph of the result over a number of years, she may be able to show the results of her work in a vivid manner.¹ She may also construct interesting graphs of the principal causes of death, the months when the greatest number of deaths occur, and the age period at which the greatest number of deaths take place.

For propaganda purposes, e.g. baby and health weeks, many interesting diagrams can be made, especially if colours are used. The most telling diagrams will be those which show the audiences facts about their *own* town, if necessary compared with others. People living in, say, Lahore are more likely to be interested in the infant mortality of Lahore than in that of Calcutta or Madras. Of course, such diagrams need careful explanation and will scarcely be appreciated by the uneducated. Still, it is the educated citizen who needs to be influenced towards better conditions.

We must now consider for a little the nature of the machinery used for collecting the facts which form the basis for vital statistics. It has been mentioned that, in order to carry on health work in a satisfactory and economical manner, we have to collect certain facts and express them in numbers. How are these facts collected? In other words, what means exist for recording events

¹ In making such observations the health visitor must be working in a defined area, and of course the same area throughout. The population of the area should also be relatively stable.

such as births and deaths. The recording of births and deaths is usually called *registration*. We have seen that a census, or numbering of the people, takes place every ten years. An interval of ten years is, however, too long a one for practical purposes. Public health, and other authorities, require constantly to know the changes in the life and health of the population which births and deaths represent. For this reason registration, which goes on all the time, is required. For such a purpose as registration, persons must be appointed whose duty is to keep the lists of births and deaths that are reported. They are called registrars. In England registrars are whole-time officials (laymen). In India registrars are appointed who may perform other work as well. There are, however, two parties to any act of registration. The registrar is the person who makes the entry, but someone else has to communicate the fact that the event, either birth or death, has taken place. Obviously a great deal depends on the willingness or unwillingness of the inhabitants of a country to communicate such facts. In Western countries registration is compulsory, that is, the person who is legally responsible for communicating the fact, which means registering the birth or death, can be punished if he or she fails to do so. Registration is not yet compulsory all over India, since public opinion is not yet either sufficiently informed or sufficiently convinced of the need for it. Accurate registration is, however, very important. 'The creation of machinery for accurate registration is one of the first steps to be taken by any municipality, rural area, or province towards putting its public health policy in order . . . as it is only by accurate figures that any true estimate of the conditions existing, or of the measures which are indicated to cope with them, can be made.'¹

The registration of births is of special importance to health visitors. Infant mortality is heaviest in the first week of life. If health visitors are to help in the work of reducing the infant mortality rate, they must see babies as soon as possible after birth. If registration is delayed and inaccurate this is impossible, and one of the main objects of health visitors' work is defeated.

The early workers in the cause of infant welfare in England found themselves faced with similar difficulties. The first

¹ *Annual Report of the Public Health Commissioner with the Government of India, 1924.*

'health visitors' (not then known by this name, and not trained as they are now) tried to discover births by the method of house-to-house visits, but it was found that this was wasteful of time and energy, and it was arranged that birth lists should be supplied by the Registrar of Births. In England Registration of Births by the parent became obligatory in 1827. The registration had to be done within forty-two days after the birth of the child, and the registrar was a civilian. Even this method did not meet the case, as, owing to the fact that registration could be performed up to 42 days, it frequently happened that the infant had died or the parents had moved before the health visitor was able to pay her first visit. This difficulty has been got over in England by the *Notification of Birth Act*, which was passed as a permissive measure in 1907. It was adopted gradually by a large number of local authorities, and in 1915 was made compulsory on all. The Act required the parent, or other person present at the birth or attending the mother, to notify the occurrence of the birth to the *Medical Officer of Health* of the district within 36 hours. Notification is required of still-births as well as those of live children.

The passing of this Act had a considerable influence on child welfare work. Information as to births became available to workers within a few days after the birth had taken place. They could thus visit very early in the child's life. In many cases now also the infant is definitely handed over to the health visitor by the midwife, in whose care it remains for ten days after birth. The legal notification of pregnancy, which is a demand made by advanced thinkers, is the next logical step. It would secure the care of the unborn infant in the way in which the Notification of Births secures the care of the newly-born infant. For obvious reasons it is not likely that such an Act will be passed for many years to come in England, much less in India.

It was mentioned that registration was not compulsory throughout India. The areas in which compulsion has not yet been applied are mostly rural areas, where the practical difficulties are naturally very great. In Bengal compulsory registration is in force in both urban and rural areas, but in the other provinces it is confined to municipalities and small towns. Where registration is not compulsory various methods are used to collect the returns. These vary greatly in the various parts of

India. In some cases the births are reported by the sweepers of the mohallas to the circle sanitary inspectors in a town. In other cases, e.g. villages, the *lumbardars*, or headmen, of the villages are responsible. In yet other cases schoolmasters are entrusted with the work. These returns are given in rural districts to the police thanas, who forward them to the civil surgeon, who is the registrar for the district. The civil surgeons forward them to the Director of Public Health, who is the registrar for the province. In the case of municipalities the returns are made to the Medical Officer of Health, who forwards them to the Director of Public Health.

It is generally acknowledged that registration is very defective throughout all parts of India. This is deplored by all health authorities. A certain amount of checking of returns is carried out by health officers, inspectors, vaccinators, etc., and advice is given as to improvements in registration work. By these means progress is being made, but it is very slow.

In the Madras Presidency, the Director of Public Health reported in 1930 that approximately 62,000 unregistered births and 20,000 unregistered deaths were detected by the subordinate staffs of the Health Department. If the amount of error is the same throughout India, it can be easily seen that the statistics are far from accurate. In particular, since births escape registration more easily than deaths, the infant mortality rates may be unduly high since they are calculated on live births. The birth-rates also show as being very low in certain districts owing to defective registration.

The cause of death is registered as well as the fact of its occurrence. But the cause of death is, of course, usually given by a person who is not in a position to know what it really was. In England a death certificate has to be signed by a qualified medical practitioner. This is impossible in India under present conditions. The result is that deaths are put down in a general way to causes such as 'fever,' 'cough,' 'dysentery,' and accurate information is impossible. This is notoriously the case with infant mortality, the true causes of which have never been scientifically investigated.

The causes of this defective registration are not far to seek. Those responsible for making the returns of both births and deaths are mostly illiterate people. The work is hardly ever a

paid whole-time job, and those responsible for doing it have not, of course, any conception of its importance or responsibility. Secondly, there is the indifference of the public, the mass of whom, of course, have the same attitude about registration as those who collect the facts. This attitude may deepen from indifference to resentment at times. At one town registration of births was said to be defective owing to an agitation against compulsory vaccination. In any case a birth or a death is regarded as a private concern, and there is no sense of citizenship to prompt its notification to the authorities, and little fear of consequences should the birth or death remain unnotified. Thirdly, in places where registration is compulsory there is not enough effort made to prosecute the defaulters, and the punishments given are so inadequate that they have no deterrent effect.

The remedies are obvious: provision of staffs competent to work the machinery of registration properly; education of the public as to its responsibilities, and as to the reasons which lie behind the demand for the information, and the benefits which may follow from it; and finally, more frequent prosecutions and fines sufficiently severe to produce a really deterrent effect.

Health visitors should do all that lies in their power to secure accurate and prompt registration. They may be able to explain the reasons for this in simple language to householders.

A word may be added about the notification of infectious diseases. This is seldom the direct responsibility of the health visitors. Even so, however, it is a bit of health work in which she can often materially assist. Public feeling on this matter is every bit as lacking as in the case of notification of births and deaths. In fact, it is often worse, as people for private reasons may wish to conceal the fact that cases of infectious disease exist in the house or neighbourhood. They are afraid of the visits of inspectors, or removal to hospital, of preventive inoculation, etc., and so do not make known the facts. They are unaware of the danger through ignorance, or else selfish personal motives are stronger than concern for the public welfare. Health visitors, especially those working in rural areas, can often be very helpful in notifying such cases of infectious disease to the authorities when they come across them in the course of their work.

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